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ABSTRACT

The document consists of 30 author contributed chapters concerned with augmentative communication service delivery. Chapter titles and authors are: "Communication Options for Persons Who Cannot Speak: Planning for Service Delivery" (David Beukelman); "Planning Service Delivery Systems" (Roland Hann II); "Planning Ohio's Augmentative Communication Problem Solving Consortium" (Julia Todd and Mary Binion); "Issues in Planning a Statewide Technology Service Delivery Program for Special Education" (Gregg Vanderheiden); "Planning Service Delivery Systems (The Florida Model)" (Edythe Finkley); "The Planning of the Service Delivery System Implemented at the Rocky Mountain Regional Center for Augmentative Communication at Memorial Hospital of Boulder" (Andrea Mann); "The Minneapolis Public Schools Augmentative Communication Program Planning Model: An ASHA Model Outreach Site" (Deanne Magnusson); "Funding Assistive Device Services and Individual Equipment" (Richard Dodds); "Creative Funding for Augmentative Communication Services" (Marilyn Buzolich); "Perspectives on Funding" (Carol Cohen); "Funding: How You Can Make It Work" (Anna Hofmann); "Funding and Service Delivery of Augmentative Communication Devices in Ontario, Canada: Status and Issues" (Penny Parnes); "Service Delivery and Related Issues at the Trace Research Center" (Roger Smith); "Implementing a Service Delivery Program: Experiences in Pennsylvania" (Mary Brady); "Michigan's Living and Learning Resource Centre" (Donna Heiner); "An Outreach Program: Addressing the Needs of the Physically Impaired in Rural Communities" (Elizabeth Moore and Deborah Allen); "The Implementation of the Service Delivery System at the Rocky Mountain Regional Center for Augmentation Communication at Memorial Hospital of Boulder" (Judith Haddow); "A Center-Based Model for Evaluation of Augmentative Communication Needs" (Sally Cook); "Minneapolis Public Schools Augmentative Service Delivery System" (Deanne Magnusson); "Non-Oral Communication Services: Service Delivery Model" (Marilyn Buzolich); "Communication Options for Persons Who Cannot Speak: Assessment and Evaluation" (David Beukelman and Pat Mirenda); "Assessment and Evaluation: Matching Students and Systems" (Joan Bruno and Barry Romich); "Overview: Evaluation/Assessment Defined and In Relation to PL 94-142 and PL 99-457" (Sara Brandenburg); "The Assessment and Evaluation of Clients for Augmentative Communication Systems: The Pennsylvania Model" (Colleen Haney and Karen Kangas); "Assessment/Evaluation of Clients" (Edythe Finkley); and "Evaluating the Need for Augmentative Communication (Faith Carlson). (DB)

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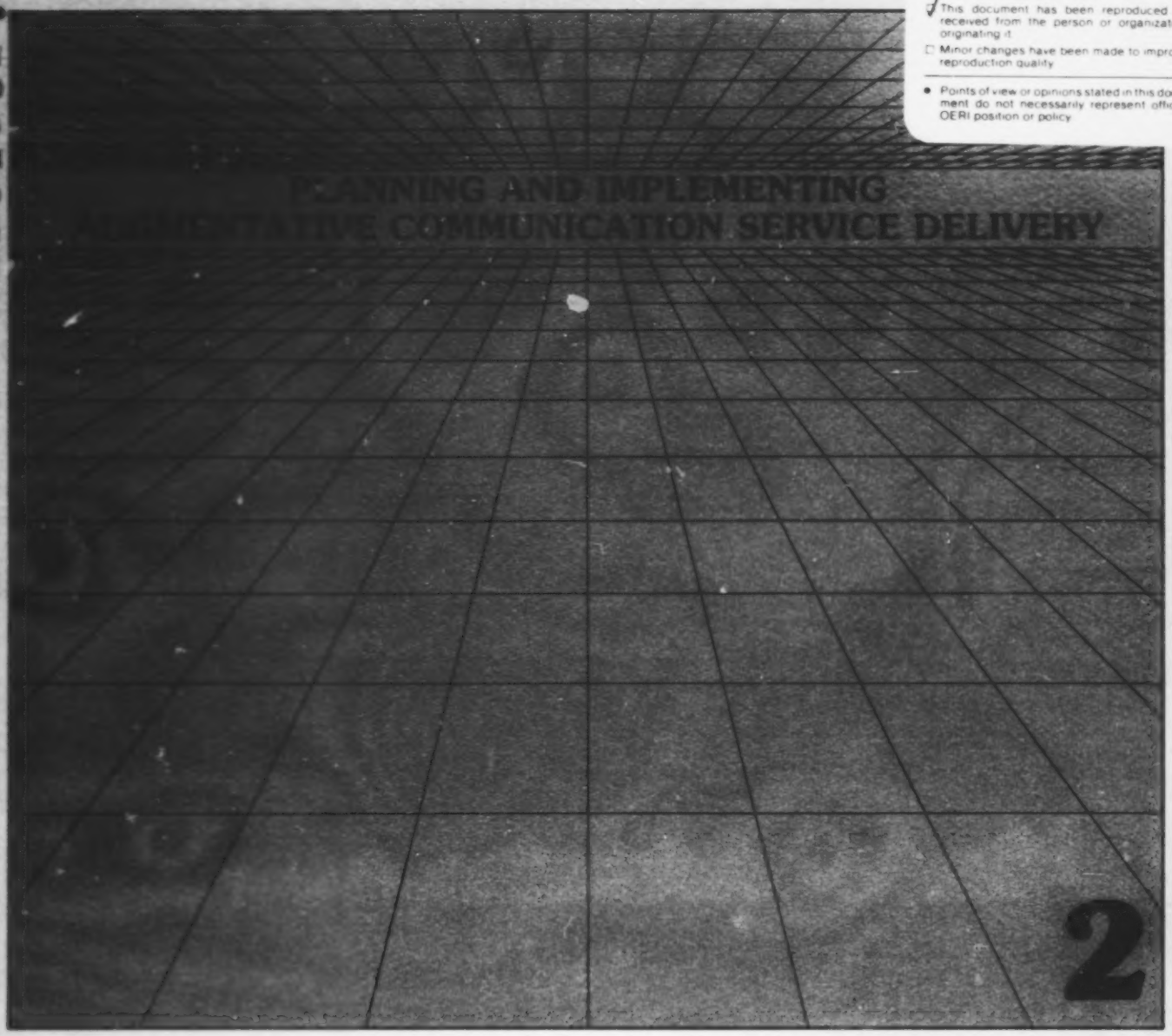

Proceedings of the National Planners Conference on Assistive Device Service Delivery

Caroline A. Coston, Ph.D., Editor

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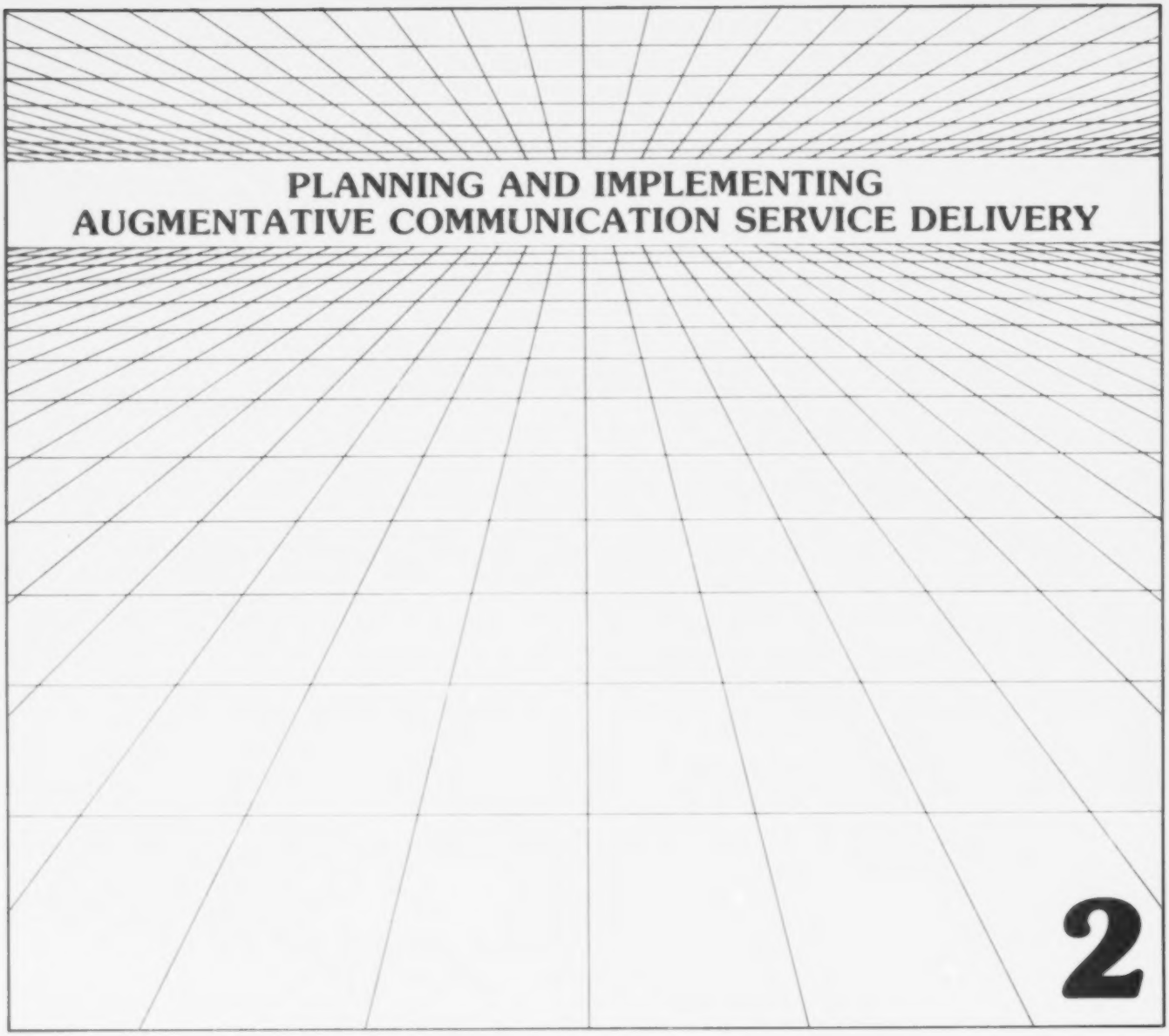

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TABLE OF CONTENTS

INTRODUCTION 1

SECTION I: ADAPTIVE TECHNOLOGY: PLANNING ASSISTIVE DEVICE SERVICES

Overview 3

Chapter 1: Communication Options For Persons Who Cannot Speak: Planning For Service Delivery 5

David Beukelman, Ph.D.

Chapter 2: Planning Service Delivery Systems 15

Roland T. Hahn, II

Chapter 3: Planning Ohio's Augmentative Communication Problem Solving Consortium 20

Julia Todd and Mary Binion

Chapter 4: Issues In Planning A Statewide Technology Service Delivery Program for Special Education 24

Gregg Vanderheiden, Ph.D.

Chapter 5: Planning Service Delivery Systems (The Florida Model) 30

Edythe F. Finkley, M.S. OTR/L

Chapter 6: The Planning Of The Service Delivery System Implemented at the Rocky Mountain Regional Center for Augmentative Communication at Memorial Hospital of Boulder 35

Andrea Mann, M.A., CCC-SP

Chapter 7: The Minneapolis Public Schools Augmentative Communication Program Planning Model: An ASHA Model Outreach Site 43

Deanne Magnusson, Ph.D.

SECTION II: ADAPTIVE TECHNOLOGY:
FUNDING FOR ASSISTIVE DEVICE PROGRAMS AND EQUIPMENT

Overview 49

Chapter 1: Funding Assistive Device Services and Individual Equipment 51
Richard Dodds

Chapter 2: Creative Funding for Augmentative Communication Services 57
Marilyn Jean Buzolich, Ph.D.

Chapter 3: Perspectives On Funding 61
Carol G. Cohen, M.S.

Chapter 4: Funding: How You Can Make It Work 64
Anna C. Hofmann

Chapter 5: Funding And Service Delivery of Augmentative Communication Devices in Ontario, Canada: Status And Issues 73
Penny H. Parnes, B.Sc., D.S.P.A.

SECTION III: ADAPTIVE TECHNOLOGY:
ASSISTIVE DEVICE SERVICE DELIVERY

Overview 85

Chapter 1: Service Delivery and Related Issues at the Trace Research And Development Center 87
Roger 0. Smith

Chapter 2: Implementing A Service Delivery Program: Experiences In Pennsylvania 96
Mary Brady

Chapter 3: Michigan's Living And Learning Resource Centre 102
Donna Heiner, Ed. S.

Chapter 4: An Outreach Program: Addressing the Needs of the Physically Impaired In Rural Communities 109
Elizabeth Moore, B.S., RPT and Deborah Allen, M.S. CCC-SP

Chapter 5: The Implementation of the Service Delivery System at the Rocky Mountain Regional Center for Augmentation Communication at Memorial Hospital of Boulder 123

Judith Haddow, M.A. CCC-SP

Chapter 6: A Center-Based Model for Evaluation of Augmentative Communication Needs 129

Sally Cook, M.A., CCC-SP

Chapter 7: Minneapolis Public Schools Augmentative Service Delivery System 138

Deanne Magnusson, Ph.D

Chapter 8: Non-Oral Communication Services: Service Delivery Model 143

Marilyn Jean Buzolich, Ph.D

SECTION IV: ADAPTIVE TECHNOLOGY: ASSESSMENT/EVALUATION

Overview 149

Chapter 1: Communication Options For Persons Who Cannot Speak: Assessment and Evaluation 151

David R. Beukelman, Ph.D., and Pat Mirenda, Ph.D

Chapter 2: Assessment and Evaluation: Matching Students and Systems 166

Joan Bruno, M.S. CCC-SP, and Barry Romich, P.E

Chapter 3: Overview: Evaluation/Assessment Defined and In Relation to PL 94-142 and PL 99-457 172

Sara Brandenburg

Chapter 4 The Assessment and Evaluation of Clients for Augmentative Communication Systems: The Pennsylvania Model 188

Colleen Haney and Karen Kangas

Chapter 5: Assessment/Evaluation of Clients 235

Edythe F. Finkley, M.S.OTR/L

Chapter 6: Evaluating the Need for Augmentative Communication 199

Faith Carlson

CONFERENCE PRESENTERS AND CONTRIBUTING AUTHORS 203

INTRODUCTION

The Great Lakes Area Regional Resource Center began working with the state education agencies in Region IV states (Illinois, Indiana, Michigan, Minnesota, Ohio, Pennsylvania, and Wisconsin) in 1984, more than three years ago, to identify issues and problems related to the development and implementation of services for individuals with communication and mobility problems. This topic was identified as an area of strong interest by states in each of the six Regional Resource Center regions, and by the Office of Special Education Programs.

During the three years of work with the Region IV states, the Great Lakes Regional Resource Center established a task force comprised of State Educational Agency (SEA) representatives involved in providing assistive device service delivery. The purpose of this task force was to identify and discuss the types of problems that state departments of special education were currently encountering. Previous discussions by this regional task force on assistive devices laid the groundwork for a multiregional work group composed of representatives from each of the six regional resource center regions. This group met to discuss and identify problems and issues, common among states, that were related to the development and implementation of adaptive assistive device services. The multiregional task force identified a series of questions related to issues that states are faced with when attempting to plan and implement services for individuals with communication and mobility problems. For instance, the cost of augmentative communication systems, mobility devices, and environmental control systems required by some handicapped individuals remains very expensive as compared to the material and equipment needs of mildly handicapped and nonhandicapped students. Therefore, funding for the cost of adaptive equipment needed to meet the assessed needs of students is of primary concern for state and local agencies. Issues that relate to funding for equipment, funding for programs and the provision of staff for services must be dealt with initially, during the program planning stages, and on an ongoing basis throughout the implementation of a service delivery plan. Thus, the problems of planning, funding and service delivery are intricately related even though they may be dealt with separately.

The group determined that a technical assistance activity most useful to states should focus on:

- identification of program planning models,
- how programs and services are being funded,
- an awareness of the types of service delivery models that are successfully being implemented, and
- the assessment models they use.

In response to this technical assistance need the Great Lakes Regional Resource Center convened the National Planners Conference on Assistive Device Service Delivery, and developed a proceedings document. The proceedings consisted of a series of papers which were presented during the large group and small group sessions of the National Planners Conference to address the issues and problems identified by the multiregional work group. These proceedings are being disseminated as a manual with background information and suggestions to assist states in planning services for individuals requiring the use of adaptive assistive devices.

The purpose of this manual is to provide:

- an overview of the issues and the problems that state education agencies and other involved agencies will need to address in providing adaptive assistive devices and services to individuals with communication and mobility problems;
- examples of planning models and effective service delivery models that reflect efforts of state education agencies, coordinating efforts among several agencies, and/or with universities, and rehabilitation centers or hospital facilities; and
- an overview of issues and considerations relative to the acquisition of funds for the purchase of equipment and the development of a service delivery system.

This document is designed to provide information to individuals affiliated with state or local education agencies and other state agencies interested in and/or responsible for the development of programs and the delivery of equipment and services to individuals who require the use of adaptive technology. Such technology includes communication aids and devices, mobility devices, environmental control systems, computer modifications, or other aids. These devices are used to increase an individual's ability to benefit from the educational environment. The information contained in this manual should provide the reader with useful, insightful suggestions and strategies that may be applied to the planning, funding and implementation of assistive device aids and services.

Caroline A. Coston, Ph.D.
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SECTION I: PLANNING ASSISTIVE DEVICE SERVICES

OVERVIEW

The first section, entitled "Adaptive Technology: Planning Assistive Device Services," provides an overview of issues related to planning and a description of the procedures/steps used in several states to plan a service delivery system. Each chapter will address the steps that occur when planning for the provision of services. The planning process may occur at the local, regional, or state education ency level with grassroots involvement from other vested groups. Although the process or appr h may be quite similar for each level initially, it may also vary based on who initiates the planning, the role of other agencies, funding sources, etc.

There are many issues and problems that states encounter when attempting to determine the most appropriate way to provide assistive device technology and services to students with handicaps. Some of these issues and problems are reflected in the following questions:

1. Who are the key actors that should be involved in the planning? (e.g., identification of the agencies, divisions, parent advocacy groups, ARC, UCP, etc.)
2. How do you gain support and commitment for the planning effort from involved parties and those whom services impact on?
3. What is the philosophy behind the focus of this planning effort? ("Why are we doing what we are doing?" How do you lay the groundwork for the effort?)
4. What are the goals (short-term and long-term) of the effort? What do you want to accomplish?
5. What are the components of the plan and what are the stages of planning/team development that facilitate the achievement of goals and objectives?
6. What populations (e.g., visually impaired, physically impaired) are to be addressed, and what ages (e.g., birth to death)?
7. Which agency will serve as the facilitator for the planning effort? Who (individual/agency) must assume leadership for the effort?
8. What initial training is needed to establish a common knowledge base among individuals involved in the planning?
9. Who will monitor the plan? (may be related to question #3)
10. How can you plan for institutionalization of the effort to stabilize the funding source for an ongoing commitment?

The information in Section I was developed by administrators and coordinators of programs developed to meet the needs of individuals with communication and mobility problems. The chapters will generally address the previously identified questions and other pertinent issues as well. Chapters 1 through 7 are summarized below.

Dr. David Beukelman, with the Barkley Augmentative Communication Center, provides an introduction to the topic of augmentative communication. In his discussion he describes the population and discusses some of the issues that planners should consider. Beukelman presents an overview of the different types of service delivery models in operation, and an orientation to some critical issues to consider relative to planning, funding and implementation of service delivery programs.

Roland Hahn II, Director of Pennsylvania Assistive Device Center in Elizabethtown, PA, provides a brief discussion of the planning process for the statewide program developed by the State Department of Special Education in Pennsylvania. The program provides technical assistance and is a central depository for assistive device equipment. Hahn discusses several issues to consider when planning assistive device service delivery. Hahn indicates there are several key factors for planners to consider, including analysis of the philosophy of the effort, the extent of need for action, and involvement of other interested individuals. Support and communication among state, regional and local administrators is essential. He presents an overview of the general planning approach used for Pennsylvania Center and identifies specific program components.

Julia Todd is Coordinator of the Ohio Resource Center for Low Incidence and Severely Handicapped. She also coordinates the activities of the Ohio Augmentative Communication Problem Solving Consortium. The planning approach which Todd and Binion discuss has emerged from efforts initiated by the Ohio State Department of Special Education and focuses on a Consortium Model. Todd and Binion's discussion of the model provides a description of the Consortium's philosophy, needs assessment, and activities. A list of various state agencies and professional organizations that participate in consortium activities is provided as an example to other planners of state agencies to involve in their planning activities.

Dr. Gregg Vanderheiden is Director of the Trace Research and Development Center located at the University of Wisconsin-Madison. The Trace Center, one of several nationally funded Rehabilitation Engineering Centers, serves individuals throughout the state of Wisconsin and from many other surrounding states as well. Vanderheiden discusses a seven-step process in planning assistive device service delivery. He suggests that individuals from several resource agencies, including the State Department of Education, should be involved in the planning process. Emphasizing the identification of state and national resources, both human and fiscal, Vanderheiden suggests that a semi-centralized system is a good initial starting point for implementing service delivery. Vanderheiden also discusses several key planning considerations, such as the various types of technology, rural service delivery, the need for population studies and funding.

Edythe Finkley, from the Florida Communication Systems Evaluation Center in Orlando, describes the process used in planning Florida's statewide evaluation center program. Finkley presents an overview of the planning model, describes the planning objectives developed for the center, the process through which the center evolved, and program development activities, which include purchasing equipment, organization, and staffing. Program strengths and weaknesses are also briefly discussed.

Andrea Mann, with the Rocky Mountain Regional Center (RMRCAC) at Memorial Hospital of Boulder, Colorado, explains the collaborative efforts between RMRCAC and the Colorado Department of Education (CDE) that led to the development of their regional service delivery program. Mann identifies the key players involved in the planning process and how support for the program was developed. She discusses some of the issues (i.e., cost effectiveness) that the planning group dealt with and the major factors that all parties agreed were crucial. Mann's discussion and detailed outline of the planning steps they used provide an applicable approach for agencies to consider.

Dr. Deanne Magnusson's discussion of Minneapolis Public School's Augmentative Communication Program provides an example of a local school district's planning approach. Magnusson provides a brief overview of the literature relative to the need for planning and components of planning models. She describes the 13-step planning process they used and the role/responsibility of those individuals involved.

CHAPTER 1

COMMUNICATION OPTIONS FOR PERSONS WHO CANNOT SPEAK: PLANNING FOR SERVICE DELIVERY

PRESENTER: David R. Beukelman
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WHAT IS IT LIKE TO BE UNABLE TO SPEAK?

For most of us, the prospect of being unable to communicate through natural speech is incomprehensible. As adults, we often take for granted our ability to use the phone, to call out to our children, or to talk with friends and family. Contrast this casual attitude toward communication with the experiences of an attorney who was unable to speak because of amyotrophic lateral sclerosis (ALS, Lou Gehrig's disease): "When I first realized that I would be unable to speak someday, I viewed it as losing my life. Communication was my life. Now, I realize that was a little overly dramatic, but not much. Speechlessness is not a loss of life, but a loss of access to much of life. I find it difficult to access my friends. They used to stop by to chat, and I wished sometimes that they would leave me alone. Now, if they stop at all, their stay is just a few minutes. They have difficulty tolerating my inability to communicate. I have lost access to them. Because of that, I do not have the opportunities to discuss, joke, and most of all, argue." (Beukelman & Garrett, 1986).

WHO ARE NONSPEAKING INDIVIDUALS?

The term "nonspeaking" refers to individuals who are unable to use natural speech to meet all of their communicative needs. Some are unable to produce sound at all, while others speak such that they can only be understood by persons very familiar with them. The inability to speak in a functional manner may be due to developmental disorders such as mental retardation or cerebral palsy, or to adult onset problems such as head injury, stroke, ALS, or multiple sclerosis. Regardless of the age or cause of onset, an inability to speak severely limits an individual's access to many of life's experiences, including those in the educational, vocational, recreational, and (to some extent) interpersonal domains. During the past dozen years, the communication needs of nonspeaking individuals have been addressed by engineers, speech-language pathologists, educators, and medical rehabilitation personnel. Any review of these efforts should highlight both the promise of augmentative approaches to communication as well as the problems yet to be solved.

HOW MANY NONSPEAKING PERSONS ARE THERE IN THE UNITED STATES?

In 1981, a committee of the American Speech-Language-Hearing Association estimated that approximately 1.25 million persons in the United States could be classified as no..speaking. Subsequent research has confirmed this estimate. Matas, Mathy-Laikko, Beukelman, and Legresley (1985) surveyed public school districts in three urban counties in western Washington State and 15 rural counties in eastern Washington State. The results of this study revealed that 0.3% of the

students in urban school districts and 0.6% of students in rural school districts were classified as nonspeaking. Aiello (1980) completed an unpublished study of urban Orange County, CA, and reported that 0.2% of school-aged students (kindergarten through high school) were nonspeaking.

A variety of physical and cognitive impairments are responsible for severe communication disorders. Matas et al. (1985) found that of the nonspeaking school-aged population:

47% are multiply handicapped,
28% are mildly or moderately mentally retarded,
14% are severely or profoundly mentally retarded,
6% are severely language handicapped,
4% are physically handicapped, and
1% are developmentally handicapped.

The nonspeaking population also includes many persons who are unable to speak due to adult onset injuries, diseases, and syndromes. For example, Saunders, Walsh, and Smith (1981) reported that 90% of persons with ALS are unable to speak at the time of their death. A survey of persons with multiple sclerosis by Beukelman, Kraft, and Freal (1985) revealed that about 4% of that population is nonspeaking. Although many persons with stroke and brain injury are nonspeaking, the demographic studies of these populations have not yet been completed.

Planning Issues: Population

1. There is a need for better demographic information about acquired speechlessness in terms of population size, etiology, living situation, and communication needs.
2. There is a need for better demographic information documenting the academic placement, living situation, and vocational/transitional status of developmentally disabled individuals who are nonspeaking.

WHAT IS AUGMENTATIVE COMMUNICATION?

Augmentative communication refers to a variety of communication approaches that are used to assist persons who are unable to communicate their messages through natural modes of communication such as speech, gesture, and writing. The augmentative approaches include nonaided techniques such as manual sign language and aided techniques such as communication boards and electronic equipment. The task of a normal speaker during communication is to formulate a message, select the words and grammar to code the message in the native language, and make the message audible so the listener can hear and interpret the message accurately.

The goal of the nonspeaking person is similar to that of the normal speaker, although the mode of communication differs. Severely communication-impaired individuals also formulate messages to be communicated; however, because natural speech is not an option for them, they must code their messages in a number of different ways, depending on their literacy abilities. For example, if they are literate they can code messages using the letters of the language through letter-by-letter spelling. However, if they are unable to spell and write, they must code the messages using pictographs of one form or another. Over the past several years, a variety of pictographic systems have been developed to support the communication efforts of nonspeaking persons. Finally, the message(s) that are represented by a symbol system are spoken or printed by one of a variety of transmission systems.

WHAT DO WE KNOW ABOUT THE WAYS IN WHICH NONSPEAKING PERSONS USE AUGMENTATIVE COMMUNICATION SYSTEMS?

A review of the research in augmentative communication reveals several recurring trends. In the following paragraphs, an attempt has been made to highlight these findings.

1. Increasing numbers of nonspeaking persons are using augmentative communication systems to interact with a wide variety of listeners. Persons who are literate have been able to use electronic communication aids for a number of years; however, in the last two years numerous options have become available for nonliterate individuals who are unable to speak. These systems are controlled through pictographic symbol sets, rather than through letter-by-letter spelling.

2. Augmentative communication system users communicate unique messages. Beukelman and Yorkston (1982) collected the communication samples of augmentative communication system users for 14 consecutive days. Of all the messages produced by these four individuals, 94% were uniquely different from all other messages. Ninety-six percent of all messages in the information provision category were unique from all other messages in this category. Sixty-four percent of all messages in the social amenities category were different from all other messages in this category.

3. The rate of augmented communication is much slower than natural speech. Communication system users communicate at a rate less than 10 words per minute, because of their physical limitations in controlling the communication aids. Although such slow communication rates are certainly preferable to the inability to communicate at all, these rates appear to restrict the communication patterns between natural speakers and augmentative communication system users.

4. Augmentative communication system users have difficulty competing with natural speakers. Numerous studies of conversations between natural speakers and augmentative communication system users reveal that natural speakers tend to "dominate" these conversations by initiating many more new topics and producing many more messages. In one such study, pairs of natural speakers were filmed as they communicated together to solve a puzzle. Following this, one of the natural speakers in each pair was required to use an augmentative communication system rather than speech to help solve the puzzle. The results of this study revealed that the natural speakers who were required to use augmentative communication equipment tended to communicate with their speaking partners in a manner identical to that seen in nonspeaking augmentative communication system users (Farrier, Yorkston, Marriner, and Beukelman, 1985).

5. Instruction of normal listeners in conjunction with instruction of the augmentative system user improves communication interaction. Three research projects have studied the impact of listener instruction on the communication between augmentative communication system users and normal listeners. For preschool children (Light, 1986), preschool through junior high aged children (Culp & Carlisle, 1987), and adults (Calculator & Luchko, 1983), instruction to listeners resulted in increased frequency and naturalness of communication in interactions with nonspeaking augmentative system users.

WHAT SERVICE DELIVERY MODELS ARE USED TO SERVE NONSPEAKING PERSONS?

The development of a variety of communication options in recent years has necessitated the development of new service delivery models to meet the needs of nonspeaking persons. These models are summarized below.

Characteristics of Service Delivery Programs

Because augmentative communication intervention programs involve communication, cognitive, physical, education, technical, and sensory issues, a transdisciplinary service approach is usually required. Regardless of the specific service delivery model implemented in a geographic region, the need for a broad array of knowledge and skill is necessary. Severe communication disorder is usually a chronic problem, often requiring years of intervention. For this reason, augmentative communication services must be longitudinally available within reasonable travelling distance to nonspeaking persons and their families.

Types of Service Delivery Models

Regional Transdisciplinary Specialty Center

The regional center is usually housed in a medical, rehabilitation, or university facility. Generally, various professional disciplines are represented on the transdisciplinary team, and the nonspeaking person is evaluated by all members of the team. It is common for such augmentative communication programs to be offered in conjunction with other services, such as medical care, educational evaluation, sitting and positioning clinics, and other rehabilitation services. The regional center model is common in Canada and the United States.

Within this model, the day-to-day intervention is carried out under one of three arrangements. First, the local referring agency, such as the public school, residential center, or rehabilitation center, forms a local service delivery team that specializes in meeting the communication needs of nonspeaking individuals. This team usually includes a speech-language pathologist, an occupational therapist or physical therapist, an educator, and a technical support person. The local team typically has a very close working relationship with the regional specialty center. The local team usually is responsible for delivering, or at least guiding, the interventions of all nonspeaking persons in the school district or agency service area.

Second, some regional specialty centers train "facilitators" who are responsible for delivering the daily augmentative communication services to nonspeaking persons under the direction of the staff at the specialty center. The facilitator is trained to meet the needs of a particular nonspeaking individual and is not expected to be knowledgeable about all areas of augmentative communication. This model was developed by the Hugh MacMillan Center in Toronto, Canada. This center has responsibility for serving the communication needs of nonspeaking persons throughout the province of Ontario, including extremely rural areas in the north.

Third, some regional specialty centers are affiliated with or contain full-time residential programs for nonspeaking students. The students are served "out of district" as the center takes responsibility for their educational programs until their immediate augmentation communication needs have been resolved and the students are returned to their "home" districts. Several long-term "visits" may be necessary as modifications of the augmentative communication system are implemented. The adult nonspeaking person may be served in a specialty center with a day program or a full-time rehabilitation program. The clients are active in the center full-time until their communication augmentation needs have been served.

Public School Network Model

Several public school augmentative communication networks are active in the United States. These programs generally take two forms. First, a network might be managed from the Office of Public Instruction in the Department of Education at the state level. Specialty staff often travel to augmentative communication clinics that are hosted by school districts located conveniently throughout the state. Nonspeaking students from around the state receive specialized services in the various catchment areas, while their day-to-day intervention needs are met by local school personnel. Usually, this model requires a local service delivery team to provide augmentative communication services within the school district.

Second, individual school districts or educational service units form self-contained augmentative communication teams. The responsibility of the team is to serve all nonspeaking/nonwriting students in the district or unit. Several of these augmentative teams may network together for educational and equipment loan purposes. The network provides continuing educational activities, interprofessional advice, and pooling of the more expensive communication equipment.

Private Practice

In a few areas, augmentative communication services are provided by a professional in private practice who travels to the nonspeaking individual's home, school, nursing home, or local hospital. Typically, the private practitioner provides the expertise in the augmentative communication area while working with school or hospital personnel from other disciplines. In many cases the private practitioner is responsible for service delivery as well as education of the agency personnel and the client's family. In order for this model to work efficiently, the private practitioner must also provide equipment necessary for appropriate evaluation and practice. However, an individual practitioner is obviously limited in terms of the amount of technical equipment s/he can purchase and loan.

Everyone for Him or Herself

Unfortunately, the "everyone for himself" model describes a much-too-common situation. In this "non-model," personnel in schools or rehabilitation settings realize they are expected to serve a nonspeaking individual. With minimal preparation, they begin to dig through their files for information from conferences, manufacturers, and journals. With these leads, the phone calling begins. Several frustrating months later, an augmentative intervention may or may not be under way. The rapid changes in the augmentative communication field make this informal model less and less effective. It is becoming increasingly necessary for some individuals in the region to view augmentative communication as their specialty and follow the developments in the field very closely.

Planning Issues: Service Delivery

1. What factors are associated with effectiveness of the various service delivery models?
2. How can service delivery models be changed to accommodate the transitions that frequently disrupt augmentative communication programs, e.g., home-school transitions, school-to-adult program transitions, etc.?
3. What service delivery models can be used to provide augmentative communication equipment for individuals with short-term communication needs, e.g., ALS?

4. What service delivery models can be used to provide augmentative communication services to persons in intensive and acute care medical settings?

WHAT IS THE INTERACTION BETWEEN AUGMENTATIVE COMMUNICATION SERVICE DELIVERY CENTERS AND TECHNICAL SUPPORT?

In addition to the regional and local augmentative communication centers, there is a network of commercial companies that design, manufacture, and distribute augmentative communication materials and equipment. The materials vendors usually interact directly with the augmentative communication centers; however, the equipment manufacturers and distributors often have a more complex relationship with both the nonspeaking individual and the augmentative communication center. At present, several technical support models appear to be operating in the United States.

Equipment Sales Only

This model allows either the nonspeaking individual or the specialty center to purchase AAC equipment directly from the distributor, and the responsibility of the distributor is simply to deliver the equipment for a given price. No equipment mounting or instructional services are included.

Technical Support Only

Because augmentative communication equipment almost always requires some personalization, the need for technical support is an important aspect of service delivery. It is not uncommon for an individual in the community or within a complex organization such as a hospital or school district to assume this role if it is not provided by the commercial community.

Equipment Sales and Technical Personalization

There are numerous examples of augmentative communication equipment distributors who also provide technical services such as system mounting, switch mounting, and even some individual equipment development. These companies often work closely with a regional augmentative communication specialty center.

Integrated Specialty Center Providing Both Equipment Sales and Personalization

There are a few examples of augmentative communication specialty centers that provide assessment and intervention services and also distribute a variety of equipment and provide technical support.

Planning Issues: Technical Services

1. How can a funding base be developed to support technical services?
2. In geographic areas where the relationships among the augmentative communication centers and the equipment distributors have not been clearly established, service delivery problems are usually very apparent. This necessary link must be included in a service delivery plan. What models can be developed to provide integrated technical services (wheelchairs, environmental control, and augmentative communication)?

HOW CAN AUGMENTATIVE COMMUNICATION SERVICES BE FUNDED?

The question of funding responsibility for services to nonspeaking persons is complex because of several factors, including etiology, age, and type of service. First, speechlessness results from a wide variety of etiologies, some of which are developmental and some of which are acquired. Because of these factors, nonspeaking persons are distributed across all age ranges from the very young to the elderly. Therefore, a wide variety of traditional third-party funding agencies are involved with nonspeaking individuals; these include health insurance companies, Medicaid agencies, Divisions of Vocational Rehabilitation, adoptive support services, Crippled Children's services, Developmental Disabilities agencies, and school districts. In addition to funding differences due to age and etiology, the funding policies themselves differ from one service to another. For example, funding for augmentative communication services for some individuals might be divided into several areas, including assessment, equipment purchase, equipment personalization, equipment maintenance, instruction for the nonspeaking individual and support personnel, and follow-up. In addition, agencies such as public schools have a legally mandated, although not uniformly interpreted, role to provide educational services to nonspeaking individuals within certain age groups. The following review of funding research will illustrate some of the discrepancies in funding patterns.

Studies that have documented funding patterns reveal several trends. First, there are different funding patterns in different geographical regions. For example, a study by Beukelman, Yorkston, and Smith (1985) in Washington State revealed that funding for equipment purchase was successfully secured 86% of the time for adults from age 19 to 40, 63% for adults from age 41 to 65, and only 43% for children from birth to age 19. However, in a similar study conducted in California, the funding patterns were quite different, in that the funding success of equipment for children was much greater than for adults of any age (Hansen, 1982).

The information about equipment funding for individuals with a variety of disabilities is more difficult to document. The Washington State data indicated that funding was secured for 68% of nonspeaking persons with cerebral palsy, 77% of persons with brain trauma, and 100% of persons with degenerative neurological disease who applied for such funding (Beukelman et al., 1985).

Funding patterns according to the type of augmentative communication services provided have received almost no attention in the research literature. In the Beukelman et al. (1985) study, all augmentative communication assessments were funded across all age groups and etiologies regardless of whether or not equipment was eventually funded and purchased.

Other Funding Sources

In addition to "traditional third-party payers," several other funding sources have been utilized to purchase augmentative communication equipment. Perhaps the most numerous of these are the "fraternal funding organizations" such as churches and service clubs. Although the benevolence of these organizations has been extensive in the past 10 years, funds secured in this manner cannot be relied upon as long-term solutions for individual clients. Rather, the role of such organizations in establishing and supplementing the development of augmentative communication center capabilities should be encouraged and expanded.

Another source of funds used to purchase augmentative communication equipment has been legal liability settlements. In some cases, the courts have ruled that a person's inability to speak is due to impairment resulting from the negligence of a second party, e.g., an automobile driver, health care provider, or employer. If the settlement proposal is correctly prepared and presented, the resulting settlement should cover funds for all areas of augmentative communication service.

Planning Issues: Funding

1. What is the responsibility of public education regarding funding of augmentative communication equipment and services? There is a need for a uniform policy regarding the responsibility of the public schools to purchase equipment and related services for nonspeaking children. Currently, some school districts purchase equipment for use in school only, some will fund all or part of the cost of personal equipment that travels between home and school, and some will not fund equipment or services of any kind.

2. What are the roles of service delivery professionals in securing funding for their clients? Because there are so many funding options available, service delivery programs will need to assist nonspeaking persons and their families to locate appropriate funding for the augmentative communication services needed on an individual basis.

3. How should funding responsibilities be divided among the various third-party funding agencies? Because many funding agencies are managed at the state level (e.g., Medicaid, Adoptive Support Services, Division of Vocational Rehabilitation, Crippled Children's Services, etc.), funding patterns within state-level agencies will need to be addressed. In addition, the funding policies of several important funding sources are made at a regional or national level. Of primary concern are the funding policies of health insurance companies. The availability of private health insurance is widespread in the United States; according to the Source Book of Health Insurance Data 1981-1982 (Health Insurance Association of America, 1981), 85% of the civilian, noninstitutional population in the United States is covered by private health insurance or by health organizations. However, the results of the Beukelman et al. (1985) study revealed that only 33% of augmentative equipment funding requests to private insurance companies were funded. A change in health plans and/or the interpretation of benefits to include communication system purchases would clearly change the present funding patterns in a dramatic and positive way. In addition to health insurance, the Medicare program plays an important role in the funding of health-related services to older Americans. If these agencies were to begin funding augmentative communication services on a routine basis, the needs of nonspeaking persons in this group would be more adequately met than they are at present.

HOW CAN THE NECESSARY PROFESSIONAL PERSONNEL BE PREPARED?

As is apparent from the previous sections of this paper, a variety of personnel are routinely involved in providing augmentative communication services. Because speechlessness is usually a chronic condition, there is a requirement for long-term instruction, regular updating of equipment, and ongoing effectiveness evaluation by professionals in local and regional agencies. During the past 15 years, almost all professional instruction has been accomplished through continuing education to professionals already active in the field. Pre-professional education related to augmentative communication is nearly nonexistent. In 1986, a survey of the catalogs of 65 colleges and universities with Speech Education and Communication Disorders training programs in Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, and Colorado revealed that only four institutions had catalogs describing courses with augmentative and alternative communication content (Beukelman, 1986). This lack of preservice emphasis in an area that has become so clinically active is surprising until one considers the personnel who are currently leading the augmentative communication field. Most of the individuals in leadership positions between 1975 and 1985 focused their efforts on the development of service

delivery programs in communication disorders, special education, and occupational therapy; or were engineers involved in the development of communication aids. Within this leadership group are very few individuals from university-based training programs. Thus, academic training programs simply do not have personnel prepared to teach in this new area.

During the past few years there have been some encouraging developments in this regard. In 1986, the American Speech-Language-Hearing Association, with support from the U.S. Department of Education, sponsored a leadership conference at which approximately 100 faculty members from communication disorders training programs across the nation received instruction in augmentative communication. In conjunction with this project, a graduate-level text in augmentative communication was prepared (Blackstone & Bruskin, 1987), along with a guide for an introductory course in augmentative communication (American Speech-Language-Hearing Association, 1986).

Planning Issues: Personnel Preparation

1. How can professional training programs develop the capability to prepare professionals in preservice training programs?
2. How can continuing education training of the professionals involved in augmentative communication be achieved on a local, regional, and national basis?

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CHAPTER 2

PLANNING SERVICE DELIVERY SYSTEMS

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Ten years ago: "Currently, only a fraction of disabled Americans are able to benefit from existing technologies that would improve the quality of their lives. A national commitment is needed to assure that all disabled Americans regardless of the nature of their disabilities or their financial status, can secure and utilize any proven technologies that will enable them to lead more productive, functional, and satisfying lives." (LaRocca & Turem, 1978).

Present: "For a society so adept in developing technology, we have been inept and indeed negligent in developing the political, social, human and organizational innovations to apply that technology in such a way that its benefits can be realized." (Blaschke, 1986)

These statements might be interpreted to mean that during the past 10 years, no progress has been achieved in providing individuals with handicaps access to high technology systems. Although we often become impatient with seeming lack of progress, perspective must be maintained regarding the contemporary nature of assistive device technology. Fifteen years ago the special education needs of students with handicaps were, by today's standards, underserved and were frequently unserved. Approximately 10 years ago the enactment of PL 94-142 provided impetus to enhance special education services. Only during the past five years have microcomputers and small-sized portable assistive devices been generally available to help meet the needs of individuals with severe disabilities.

Additionally, as a low-incidence population, persons with severe handicaps represented a relatively small voice of consumers. Their needs were often overshadowed by the typically less complex needs of higher incidence populations. Although action committees, lobbies, etc., quickly formed to voice and advocate for the needs of individuals with mental retardation, learning disabilities, etc., individuals with severe and multiple handicaps, for whom sophisticated technology systems held extraordinary promise, often sought solutions and services individually or in very small, relatively unorganized groups.

Following enactment of PL 94-142, local education agencies (LEA) were responsible for providing services to students with handicaps. The prevailing model for delivering services to children with handicaps evolved in large urban areas and typically involved employing highly trained professionals. This model was found to be inappropriate for many areas of the country where populations are not large enough to ensure cost effectiveness in this type of delivery system. "Alternatives to this model have been to place children far from home in residential facilities, to require extended travel to obtain services, or to provide no services at all. These options are unsatisfactory in the light of both federal mandates and the growing evidence that there is educational value in leaving children in their home environment and in integrating as much as possible handicapped children with nonhandicapped children" (Werdin, 1984). Least restrictive environment concerns, very recent successful application of emerging high technology to meet students with handicaps needs, and a public readiness to support assistance efforts have very recently com-

bined to encourage a renewed look at service delivery models. Unfortunately, there has been precious little research information on which to base decision making.

Planning is a necessary starting point to develop service delivery methods to meet the assistive device needs of individuals with handicaps. The type and amount of planning initially needed and the amount of energy needed to be expended on this effort will vary greatly in different areas depending on the state-of-the-state, priorities that exist in regional service areas, and the perceived need for efforts and funds to be directed to assistive device services by everyone in the area from LEA practitioners to state education agency (SEA) administrators. Someone must, however, initiate action by identifying a need and devising a draft method to meet the need and solve problems.

PLANNING ISSUES

The level at which the problems and needs are identified and the fiscal commitments that can rapidly be brought to bear will significantly determine the direction and level of initial planning needed. If a lead agency (e.g., a SEA) has determined that the problem is a high priority and allocates funds to meet needs at the state level, services delivery can be initiated quickly, pilot programs can be activated, and program planning can indeed be concurrent with the initial direct services efforts. If, however, start-up funds are unsecured, services needs are not clearly defined, and no lead agency has emerged, more deliberate preservice planning is needed.

Regardless of the level at which planning and services ideas are initiated (local, regional, state), numerous issues related to planning must at some point be discussed and resolved for an organized, effective service delivery system to meet changing needs and to maintain needed services over time. An analysis of the philosophy of the effort should be one of the first issues addressed. A determination should be made that there is truly a need for action and that the proposed efforts are a high priority for services consideration. A determination should be made that other groups share the feeling that proposed services are needed.

If a lead agency has not emerged, or the agency from which the original ideas for services needs is not in a position to provide leadership to facilitate planning, an individual or agency must be encouraged to accept this role. An individual must accept responsibility for developing an initial outline as a starting point for discussion. From this outline can emerge draft (idea stage) short- and long-range goals. The draft should identify initial target populations to be served dependent on: projected funding levels; nonduplication of existing services; and ability to provide services to meet short-range goals.

Support and commitment for the planning effort should be gained at the earliest possible time. Communications must be established with state, regional, or local administration depending on the level of initial services focus. Advantages of the project should be discussed. Emphasize that the planned services are part of their mission. Cost-saving data should be presented.

After general support is gained from key leaders at different service delivery levels, individuals and agencies to be involved in the planning group should be identified. Depending on the level of planning to be pursued, either state level heads of agencies could be brought together for discussions, or individuals could be designated by state agency directors to participate in the planning process.

To reduce ambiguity and provide a common base for discussion, awareness level training should be provided to all planners. This effort could include showcasing state-of-the-art assistive device technology to stimulate additional ideas regarding services goals to be pursued. Following the

awareness activity, initial planning sessions should be held as input meetings to review, revise, expand or reduce the draft services document. The planning group should develop subcommittees as needed and set timelines to finalize all details needed to initiate services. The planning group needs to also consider the needs for monitoring services delivery progress. Data should be collected regarding the programs that are initiated to determine benefits provided to consumers of the services and to monitor the need for any future changes in services. The planning group will also need to be concerned with efforts to stabilize funding sources for development and continuation of long-term service delivery systems.

In 1982, the Office of Technology Assessment (OTA) concluded in a report "Technology and Handicapped People," that "despite the existence of numerous, important problems relating to developing technologies, the more serious questions are social ones -- of financing, of conflicting and ill-defined goals, of hesitancy over the demands of distributive justice, and of isolated and uncoordinated programs" (OTA, 1982). The SEA in Pennsylvania recognized the need for planning and program development that could lead to delivery of tangible programs and services to directly benefit students with handicaps. In 1984, Gary Makuch, Director of the Bureau of Special Education (BSE) for the Pennsylvania Department of Education (PDE), indicated that some PL 94-142 funds would be directed toward meeting assistive device services needs and suggested that an action plan be drafted to meet these service needs of Pennsylvania LEAs and students with handicaps. Pennsylvania had an established Resource System of projects designed to develop programs and provide technical assistance to LEAs regarding the needs of students with handicaps. As director of the Central Pennsylvania Special Education Regional Resource Center (SERRC), this author developed a draft of goals and objectives to be accomplished by an Assistive Device Center (ADC) to be managed by the SERRC. The draft was reviewed and input was provided by BSE staff.

PLANNING STEPS

Planning to develop the Pennsylvania service delivery system initially involved a variety of information gathering efforts. In 1980, the National Association of State Directors of Special Education (NASDSE) conducted a study of existing assistive device service delivery systems and found that "while some centers for assistive devices do exist, none provide comprehensive services." The NASDSE document "Assistive Devices for Handicapped Students: A Model and Guide for a Statewide Delivery System" was used to help prioritize initial program objectives. Input regarding the assistive device services model was sought from numerous nationally recognized assistive device service providers, including the Trace Research and Development Center, the Children's Hospital at Stanford, the Maryland Rehabilitation Center, the Tennessee Rehabilitation Engineering Center, etc.

An initial plan for delivery of assistive device services through the ADC was developed and included the following major components:

> Staffing -- hire program coordinator and recruit/hire an augmentative communications specialist and a rehabilitation engineer.
>
> Awareness -- conduct a statewide awareness conference to provide LEA and regional staff with information on state-of-the-art assistive devices and information on how these systems can specifically enable students with handicaps to best benefit from their educational program.
>
> Information Dissemination -- gather and disseminate assistive device information statewide via newsletter, electronic bulletin boards, and direct communication with practitioners via a toll-free hotline.

Training -- develop training materials and conduct workshops at LEAs and on a regional basis throughout Pennsylvania. Work toward developing a network of local experts, and provide intensive training for this group.

Provide Assistive Device Systems for Student/LEA Use -- develop a short-term loan program to provide systems to LEAs for evaluation of students' assistive device needs. Provide assistive device systems for individual student use (available 24 hours per day, 12 months per year, at home and at school) by establishing an assistive device long-term loan program.

Conduct Long-Range Plans for Assistive Device Services -- continue to analyze needs assessment data and coordinate efforts to produce a memo of understanding among service delivery providers state-wide.

Additional planning activities conducted by the Pennsylvania ADC, following establishment of the program, included development of an advisory committee comprised of special education administrators, supervisors, higher education faculty, speech therapists, and classroom teachers. This committee meets at least annually to provide input regarding services needs in the state and to provide reaction to proposed ADC services. Informal meetings and discussions are also held with a wide variety of program administrators and service providers representing assistive device programs throughout the United States. These nationally recognized experts provide excellent feedback regarding the new services ideas proposed by the ADC. The ADC also sponsors symposia to have national assistive device leaders meet to discuss services needs that can be addressed by the ADC.

PROGRAM STRENGTHS AND WEAKNESSES

The Pennsylvania model for service delivery via the ADC was able to address many of the planning issues originally detailed since a funding source was available at the onset of planning and a resource center, familiar with program development, acted as the lead agency to coordinate planning and initiate services. The original draft of goals and objectives was easily completed since the primary author had experience in program development for populations that can benefit from assistive devices. The SERRC, the managing project of the ADC, had access to input from LEAs and regional service providers to initiate a network of communication regarding services needs. The SERRC's past history in providing quality training programs gave credibility to awareness activities and initial training programs. ADC staff members' frequent interchange of ideas with nationally recognized experts in the assistive device field enabled the ADC to get rapid and candid feedback on proposed or previously initiated services and procedures.

One major weakness of the ADC program to date is that the goals regarding interagency planning, hopefully leading to a better understanding among service delivery providers in the state, has not yet been actively pursued. Energy thus far has been directed toward information dissemination, training LEA staff in assessment and use of assistive devices, and toward providing assistive device systems for students with handicaps. Having other state agencies and regional service providers united toward the goal of having persons with handicaps having lifetime access to assistive devices would enable this goal to possibly be realized. No one agency can provide all the needed services to all populations at all age levels. While the ADC has been attempting to help meet the assistive device needs of special education students age three to twenty-one, the present need is to begin planning efforts linking all agencies into comprehensive services delivery programs.

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CHAPTER 3

PLANNING: OHIO'S AUGMENTATIVE COMMUNICATION PROBLEM SOLVING CONSORTIUM

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Effective communication is vital in all areas of life, including social development, education, medical care, employment, and personal pursuits. Services needed by nonspeaking persons are provided by various state agencies as well as professional and parent organizations.

Ohio's Augmentative Communication Problem Solving Consortium is an organized group of agencies, service organizations, parents, and practitioners concerned about the delivery of comprehensive services to nonspeaking individuals, their families, and service providers. Representatives from the Ohio State Departments of Education, Rehabilitation, Health, Human Services, and Mental Retardation/Developmental Disabilities, as well as university, medical, research, and educational facilities participate on the consortium. The entire consortium meets several times a year, while subcommittees meet more frequently.

INITIATION OF THE CONSORTIUM

In Ohio, the initial requests to address the special delivery issues related to nonspeaking persons came from parents and educational practitioners. These requests were made to the Ohio Resource Center for Low Incidence and Severely Handicapped (ORCLISH) through the 16 Special Education Regional Resource Centers (SERRCs). These centers, funded by the Ohio Department of Education, Division of Special Education, are responsible for personnel development training, evaluation, and technical assistance to parents and educators of school-aged handicapped children. Since the issues involve services from many agencies, the Augmentative Communication Problem Solving Consortium was initiated in March 1985. The consortium is facilitated by staff of the Ohio Resource Center for Low Incidence and Severely Handicapped.

AGENCY PARTICIPATION

Representatives were invited from the following groups:

- Great Lakes Area Regional Resource Center
- Hospital/Rehabilitation Centers
- LINC Resources, Inc.
- Local Education Agencies (urban, suburban, and rural)
- Manufacturers (Prentke Romich Company)
- Ohio Department of Education
- Ohio Department of Health

- Ohio Department of Human Services
- Ohio Department of Mental Retardation and Developmental Disabilities
- Ohio Rehabilitation Services Commission
- Ohio Resource Center for Low Incidence and Severely Handicapped
- Parents/Families/Caregivers/Consumers
- Professional Organizations
    - American Speech-Language-Hearing Association
    - Council for Exceptional Children
    - Great Lakes Communication Enhancement Group
    - International Society for Augmentative and Alternative Communication
    - Ohio Speech-Language-Hearing Association
- Residential Schools
- Special Education Regional Resource Centers
- Universities and Colleges

It was felt that administrative personnel as well as practitioners should be involved and that the group should remain a "workable size." Some personnel represent more than one agency or organization. Recommendations for additional membership have been considered and acted upon when appropriate. Currently, private agencies, insurance companies, service organizations, and consumers are not represented as members of the consortium. These groups are, however, target group for awareness activities. Active participation will be solicited from these groups at that time. Several consumers have reviewed the consortium activities to this point. The consortium would like to see more active consumer participation but has not been able to identify an individual who can make the time and travel commitment. All meetings have been held in Columbus, Ohio.

PHILOSOPHY AND GOALS

Children, youth, and adults needing augmentative and alternative communication systems should have access to a comprehensive continuum of services in order that their communication needs are appropriately assessed, the system procured, and appropriate training given to the student, family, and caregivers. Parts of these types of services exist in a few places in the state, but there needs to be a coordinated effort that results in a continuum of comprehensive services.

The consortium identified the following goal for the purpose of the group's activities:

> Goal: to work together to further develop comprehensive augmentative communication services to nonvocal individuals, their families, and service providers.

Interagency cooperation is the philosophy interwoven into all consortium activities. Two primary benefits to interagency cooperation in augmentative and alternative communication are better service to nonspeaking people and lower total cost to the state.

TARGET GROUPS FOR CONSORTIUM ACTIVITIES

Included in the consortium's definition of nonspeaking are children, youth, adults, and elderly for whom speech is temporarily or permanently inadequate to meet their communication needs. The

inability to speak is not due primarily to a hearing impairment. These individuals may be physically able or severely physically disabled. They may have been nonspeaking from birth, or injured through illness or accident. Augmentative and alternative communication are the methods used by nonspeaking individuals in communication.

NEEDS ASSESSMENT PROCESS

Through a likelihood-impact analysis needs assessment process, the consortium identified a number of areas of concern:

- research and design of new products,
- replication studies/research,
- training,
- public awareness,
- preservice training,
- funding,
- information dissemination,
- consumer-related issues, and
- data collection.

The group identified activities within each area of concern that needed to occur in order to make the goal a reality. To conduct a likelihood-impact analysis process, the group determined a general goal. Events which need to occur in order to achieve the goals were then listed. Each individual rated on a scale from 1 to 5 the:

- likelihood of the event's occurring and
- impact of the event (presume occurrence) on the achievement of the goal.

Small groups then worked on:

- strategies for achieving the event,
- effects of achieving the event, and
- consequences of not achieving the event.

The results of the likelihood-impact rating were tallied and plotted on a graph. High impact/high likelihood events would be worked on first. The results of this process were used to identify target areas for consortium activities.

Event statements with highest likelihood and highest impact identified were:

- communicate with developers about the needs of consumers and educational and vocational personnel,
- identify teaching/training techniques related to augmentative communication devices,
- compile and disseminate information related to research and design of new products,
- provide awareness training for educational personnel,
- provide awareness training for other service providers, working directly with nonvocal children,

- provide intensive training for educational personnel,
- identify funding sources,
- disseminate information on funding sources,
- compile and disseminate list of evaluation and assessment services, and
- identify and disseminate list of training services and programs.

CONSORTIUM ACTIVITIES

Year 1

Since the consortium represented the entire spectrum of ages and services, it was decided that each person should initiate activities within their own agency or organization and report to the group. The consortium meetings were always extremely informative as participants shared information about their efforts and knowledge.

Year 2

During the second year the group felt that they ought to focus their efforts so that they might influence the state-level service delivery system. The group was concerned about "perpetual information exchange" and the risk of losing the interest of key consortium members.

The group determined that the event statements regarding awareness at the administrative "decision making" level would have the most impact on the service delivery system. By pointing out the complexity of the problems and solutions for the client and agency, it was hoped that the administrator might recognize the programmatic and fiscal advantages of working together as well as their responsibility to serve this population.

A slide-tape presentation and brochure, "Let's Talk," were developed by the consortium. Designed for top-level state administrators, the program is an overview of augmentative communication and the importance of cooperation and coordinator of services at the state level. Consortium members will schedule meetings with top level state administrators, make the presentation, and offer the assistance of consortium members in discussing that agency's service to the non-speaking population.

STRENGTHS AND WEAKNESSES

A major strength of this consortium is the ability to meet, exchange information, and plan for methods to impact the state-level service delivery system. A major weakness is the inability to make changes quickly. This is a slow process but one that is worth the effort. Changes that are made are likely to last because they've become part of "the system."

CHAPTER 4

ISSUES IN PLANNING A STATEWIDE TECHNOLOGY SERVICE DELIVERY PROGRAM FOR SPECIAL EDUCATION

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INTRODUCTION

There is no doubt that properly applied technology can facilitate many activities, including the education of individuals with special needs. Improper technology, as well as the improper application of the correct technology, however, both usually result in large expenditures of time and money with little, no, or negative results. In addition, a poorly conceived technology program which fails can cause discouragement and loss of support for this important area. This paper focuses on some issues that should be borne in mind in the development of a technology support program for special education. The comments are particularly directed toward programs for a state like Wisconsin, which has a small population and large thinly populated areas.

CENTRALIZED AND DISPERSED

One challenge in developing a technology support system is developing a model which provides the concentration necessary to maintain technical depth and expertise as well as the dispersion required to serve the entire state. Technology today is moving and advancing at such a rate that it is not possible for individuals to keep on top of it part-time. In fact, it takes different individuals who divide the area and each study a portion in order to stay on top of developments and be able to separate the wheat from the large amount of chaff in this area. In addition, technological advances result in a need for fairly rapid turnover of equipment. Although the advent of new equipment does not mean that older equipment is obsolete, the support/resource system for a state does need to continually secure and evaluate newer equipment as well as computer software in order to determine which equipment and programs should be considered for wider use. This is an especially difficult task for the noncomputer-based technology aids (sensory, communication, writing, mobility, and manipulation education and therapy aids).

This need for depth of knowledge and equipment is best met through one or two major centers. These centers by themselves, however, would have great difficulty in meeting the dispersed needs of the whole state. The quality of technical assistance is likely to be a function of the proximity to these centers, leaving most of the state poorly served. The converse (a wide network of interconnected centers dispersed across the state), however, would either be extremely expensive (to staff many centers) or would not provide enough concentration to develop any depth of expertise (if centers were too small).

One model to achieve this would be a three-level central/regional/local format. A central center could provide the coordination, a central equipment inventory system, a comprehensive demonstration area, and a source for training and the development of resource materials. Star centers around the state would provide regional resource points for consultation and support. Finally,

the individual resource personnel dispersed throughout the various school systems would provide the base for the network. These resource personnel would work with other teachers and therapists to help disseminate, apply, and support the technology directly at the application level.

DIFFERENT TYPES OF TECHNOLOGY

The term "technology" or "special education technology" is tossed around in ways that suggest that it is some homogeneous group of devices or equipment. In fact, it takes many very distinct and different forms. Some of these different forms are:

1. Special therapeutic technology,
2. Special education technology,
3. Personal assistive devices which facilitate education, and
4. Special adaptations to regular education technology.

These different types of technology each play different roles, each have different constraints, and each require different types of support mechanisms.

Special education and special therapy technologies are designed to be tools that the teacher or therapist masters and uses within the education or therapy program. Teachers/therapists throughout the state need to be made aware of appropriate technologies, need to have a mechanism for sifting through the vast number of devices and software packages becoming available in order to determine what is appropriate for their needs, and need to have a mechanism for acquiring the training necessary to effectively incorporate these tools in their clinical/educational practice.

Personal assistive device technology, on the other hand, is not used by the teacher so much as by the student. Devices in this category can range from power wheelchairs to communication prostheses to electronic writing systems to reading aids. Often, specialized expertise, training and experience is required in the selection and fitting of these technologies which is not required for their use or incorporation in the classroom.

Special adaptations to standard educational equipment is different again. Here, the goal is to allow an individual with a handicap to be able to use the same pieces of educational equipment and/or software as are being used by the rest of the students. In this case, no additional training in the use of the standard technology is necessary, since it has already been incorporated into the classroom. Instead, specialized technical expertise, and perhaps therapeutic expertise, is required in order to identify and install a modification to the educational equipment so that it can be operated by the student with special needs. Once the problem has been evaluated and the adaptation identified and installed, support becomes fairly straightforward, involving maintenance and monitoring of the adaptation's effectiveness.

Some of the support described above is best delivered through centralized evaluation and technology support centers which serve as a central reference point for browsing as well as for looking up information on particular devices or systems. This type of information is particularly valuable for teachers and clinicians in remote locations who do not otherwise get the chance to see the different devices and technologies.

> INTEGRATIVE INFORMATION -- This is partially digested and summative information. Mass lists of everything available may be useful for browsing and for looking up items when one already knows what one wants, but it provides limited understanding. Integrative information, on the other hand, provides the clinicians who are less familiar

with the technologies with materials that help them understand the various types of equipment and their functions. It also provides them with suggested initial choices for those just beginning in an area, as well as guidelines for selection of materials for specific needs.

SPECIALIZED EVALUATION TEAMS -- Where specialized personal assistive devices or special access adaptations are required, the system should provide specialized teams with the necessary equipment, training and experience required to select and fit the device/interface. It should also provide follow-up and support to the teacher/clinician for those devices or adaptations that require it.

TRAINING -- Training is necessary on many levels. It extends from a general awareness of the different technologies and different support systems provided by the Special Education Technology Support System to direct training in the implementation and application of specific technologies. Some of this training can be provided through central or regional facilities; other training will need to be provided on an in-service basis at the school sites throughout the state.

EQUIPMENT DEMONSTRATION -- Hands-on experience with equipment is essential for its understanding. A central demonstration area can help to meet this need. In addition, however, regional and perhaps traveling equipment demonstration facilities will be required in order to provide teachers in remote locations with opportunities for hands-on experience with the various technologies.

LOW TECHNOLOGY SUPPORT SYSTEM -- In many ways, it is easier to support high technology than low technology solutions. For one thing, high technology solutions are better documented, and generally fewer in number. For another, manufacturers generally do a better job both of advertising and supporting these approaches. Finally, there is more glamour and it is more "fun." Yet low technology approaches are often more effective and easier for school systems to implement. Specific provision should be made in the Special Education Technology Support System for provision of information and support for low technology solution strategies.

EQUIPMENT LOAN PROGRAM -- An equipment loan program can be a very cost-effective component of a technology support system. Half or more of the technology that is recommended today for specific clients turns out to be inappropriate or ineffective. Often it ends up in a closet, and the student ends up without anything. Equipment loan programs can provide a mechanism for trial of equipment prior to permanent placement. They can also provide a mechanism for assistance to individuals who are temporarily disabled, or who are waiting for systems that have been ordered but have a long delivery period. The equipment loan program can be fully centralized, where all aids are warehoused and maintained at a central location, or it can have multiple distribution points coordinated through a central facility.

SPECIAL ENGINEERING SERVICES -- In order to handle special adaptation needs, specialized rehabilitation technology services should be available through the system.

SOFTWARE LIBRARY -- The fastest growing area of rehabilitation technology is special education software. New programs are constantly being announced and released. The cost to secure and try out the software, however, is prohibitive. A system of central and regional software evaluation libraries should be provided.

EMPHASIS ON RURAL SERVICE DELIVERY PROGRAM

A popular belief is that individuals with disabled children tend to gravitate toward urban centers. This in turn implies that the need for special education technology would be greater in the urban centers. In fact, recent research calls this assumption into question. Mattas (1983) found that the incidence of individuals with severe communication impairments was twice as high in rural as in urban areas (6% of the special education rural population versus 3% of the special education urban population). Preliminary results from the state of Nebraska (Beukelman, personal communication) are finding almost identical results to those found in the state of Washington. The fact that the incidence of severely speech-impaired individuals was also twice as high as the general population in rural versus urban centers (6% of rural, versus 3% of the urban total population) further suggests that this is not a relative number, but that there may in fact be twice as many individuals requiring technology in rural settings, at least in this area of need. Since a large portion of the population of Wisconsin is in rural areas, very special attention needs to be paid to determining where the needs lie and in developing a good rural service delivery system.

NEEDS AND POPULATION STUDIES: INITIAL AND CONTINUAL

Clearly, any technology delivery plan for the state should start with a good needs and population analysis. However, an ongoing needs analysis should also be built into any technology delivery system. This should be coupled with an evaluation program within the Special Education Technology Support System. Over time, the needs of the state should change, as the technology delivery system evolves. A good needs tracking and system evaluation program can help to identify the changing adaptation categories. In general, these technologies are very specialized, and are not needed en masse within any school or school district. As a result, it is not cost-effective to develop or maintain experts or teams for these technologies on a local basis. Regional or centralized centers for these technologies will be the most appropriate. It is also probable that the state resource programs for these various technologies would not all be located in one place. For example, the state central resource programs for visual aids, for deaf aids, and for augmentative communication aids may all be located at different places in order to take advantage of existing centers of expertise in these areas.

LINKING TO EXISTING CENTERS

Of particular importance in setting up a good resource program for a state is taking advantage of key resources in centers which already exist on a local, state, or national basis. A good technology support system can be incredibly expensive if one attempts to build it from scratch. Unfortunately, a mediocre technology support system can do as much harm as good, due to the high cost of misinformation and over-application or misapplication of technology. By careful utilization of already existing programs on a regional and national basis, however, considerable expertise can be tapped for the support system without incurring the tremendous cost of maintaining expertise. There are national information systems, for example, as well as specialized centers that generate summary resource materials. Each state has different facilities within its borders that can also be used. By either incorporating these programs in the state's support network, or by subcontracting specific services to be provided to the network, the already existing expertise in these respective areas can be very cost-effectively tapped. These same programs should also be tapped for key advisory members, both to assist in setting up a state's technology support system and to monitor the operation and improvement of the system over time. Such an advisory committee should also include individuals from other states having technology support systems. This can be a particularly effective way to share both good ideas and mistakes in this new area.

TECHNOLOGY FUNDING

One of the most difficult areas is the topic of technology funding. Securing funding for technology can be difficult, even when technology can be shown to directly result in more savings than the cost for the technology. One of the first steps in setting up a technology support system will be identifying the various options and opportunities for technology funding. In some ways, this is a chicken-and-egg situation. The number of resources available to pay for the technology at the present time is limited by the ability of technology to demonstrate its cost-effectiveness, which is in turn limited by the lack of effective resource and support systems for technology. Even with limited technology funding, however, a strong technology support system for a state is important. In fact, when technology application resources are limited, it is most important that the funds available be spent in the most informed and effective manner.

FOLLOW-UP AND FOLLOW-ALONG

Finally, it is important to stress the need for both follow-up and follow-along in the delivery of rehabilitation technologies. Follow-up is defined as a periodic check with individuals who have received services through the system. This includes both professionals and students. Follow-along, on the other hand, is a more continual tracking of the individual's progress and assistance in carrying through any recommendations.

Follow-up is mostly used to catch serious problems and to evaluate the effectiveness of the support system. By checking periodically with the individuals receiving support, it is possible to determine when the recommendations or support being provided are insufficient or inappropriate. Both lead to remedial action with that particular recipient, and also to better design of the overall support system.

Follow-along is targeted more toward providing ongoing support to programs or individuals throughout the rehabilitation/education process. Some of the activities of the support system have follow-along so integrally built into them that it is of no concern. Other activities (special in-service seminars, special evaluations, etc.) are inherently one-time activities. If they do not have specific a follow-up/follow-along component attached to them, they are usually substantially less effective and appropriate than they could/should be.

In a well-designed, three-layer system, most of the direct service delivery to students would occur at Level 3. In most cases, these individuals are close enough to the students themselves that follow-up and follow-along can be done fairly easily. Time, however, needs to be budgeted for this process.

STEPS IN PLANNING A STATEWIDE TECHNOLOGY SERVICE DELIVERY PROGRAM

There is no step-by-step procedure that can be delineated for developing a statewide program. Although the needs within different states are generally the same (numbers and types of disabilities per capita do not significantly vary), the constraints and the resources can and do differ significantly. Constraints include the total size of the population to be served, the geographic distribution, political considerations, the structure of the educational system within the state, etc. The resources include specialized centers or programs in the state or region, individuals and programs within the state, and the existing structure of the educational system.

Some general steps that might be taken in setting up a technology support system in a state would be:

1. Formation of a small study group: Three to four people, including key inter-

ested individual(s) from the state education system and individuals with technology and special education background.

2. Identification of resource personnel: People who, on national and state basis, who can be used for consultation. Individuals from this pool can later be chosen for the advisory committee as the process becomes more formal.
3. Identification of resources in state/area: Based on a preliminary armchair/literature-based needs analysis, examine the state to find out what resources already existing, including special centers and structures within the educational system.
4. Design and conduct a needs analysis study: Make a moderate attempt to identify the distribution and characteristics of the needs within the state; as time progresses, this step may be less necessary as studies by other, similar states are conducted and published. At this point, however, there is insufficient information in the literature, and considerable risk of false assumption in this area.
5. Identify the funding resources: It should be kept in mind that the primary function of the support system is not to provide equipment, but to support the provision and use of the equipment. If the equipment is truly an effective part of either the rehabilitation or the education of these individuals, it should in general be provided through the same mechanisms as all other rehabilitation or education services. Nevertheless, funding is an important component, and resources and policy should be identified early so that expectations and support systems can develop appropriately.
6. Start out on a medium to small, semicentralized basis: It is impossible at this time to design a comprehensive support system. The resources and expertise do not exist throughout the system; the technology is not ready; and we simply don't know what the final system should look like. A semi-centralized program consisting of a central support center working with both regional centers and special expertise centers is recommended in order to provide a cost-effective mechanism for developing and maintaining expertise while still being able to disperse the expertise through the state. Over time, the number of regional centers can grow and develop more and more local (third-level) formalized affiliations.
7. Initial focus on information and training: Although initial expectations of the technology support system may be that it will supply technology, its primary products in fact should be information, training, and special evaluation (through its specialization centers). Although the state may decide to distribute equipment through the program, this should be done carefully and in conjunction with its specialized evaluation centers.

IN SUMMARY

There is decidedly a need for the development of technology support systems within states, in order to enable special education programs to take effective advantage of the newer technologies being released. Setting up such a system, however, is not a straightforward task, and the best form for this support system would vary from state to state. A three-layer approach is suggested which provides for concentrated central expertise, regional resource points, and a network of individuals at the local level. The focus of this system should be on support rather than equipment distribution, with an emphasis on information, training, and specialized evaluation. It is further suggested that a network of support systems between states be established in order to minimize duplicated effort in the generation of new materials and to maximize utilization of the expertise and experience of the different support programs.

CHAPTER 5
PLANNING SERVICE DELIVERY SYSTEMS (THE FLORIDA MODEL)

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Evaluation Team Leader

INTRODUCTION

Most terrific ideas begin with a projected solution for some problem that is significant to us, unknown to anyone else, unjustified in relation to the other goals of the organization, too costly to consider, outside of the organization's professional expertise and timeliness, untested (meaning no one has ever done it before), not needed by the majority of the population, and larger than the physical plant can accommodate. Those of us with good intentions frequently have our enthusiasm for innovative services thwarted by one or more of the previously mentioned counter responses. Disappointments and frustrations of this sort can be decreased or avoided by planning and implementing strategies that will provide solutions and alternatives for the kinds of counter responses that can be expected. Counter responses are unique to the organization to which the idea is being presented and can vary according to the geographic location, the funding structure, the administrative personnel, the purpose and philosophy of the organization, and/or affiliations with other agencies or organizations.

Planning models are many and must be selected according to some of the same factors that make counter responses unique to an organization. The discrepancy model is a basic model and is frequently used. It begins with the identification of a needs statement which is equal to the difference between what is (actual) and what is desired (ideal). Solutions are generated and compared for each need statement regardless of whether the solution is valued pro or con, good or bad, or appropriate or inappropriate. This process should end with agreement on the best solutions and should be productive regardless of the magnitude or breadth of the need.

Planning assumes previous consideration before action is taken as opposed to being reactive to forces that have already been put into motion. All is not lost if the latter situation occurs, it simply requires that available resources have to be managed until new decisions are made and new directions planned. Passive planning, a state of observation and not action, is counter productive. Active planning is systematic, purposeful, and controlling; it shapes uncontrollable events into achievable goals. Effective planning influences if and how an idea is accepted and consequently its longevity, the enthusiasm of the implementors, and the quality and timeliness of the product or service being provided.

OVERVIEW OF THE MODEL

At the Communication Systems Evaluation Center (CSEC), the idea of developing and operating a service to meet the needs of nonspeaking students was supported by funds from the Florida Department of Education (FDOE). In 1980, support began in the form of yearly block grants for a period of three years and the funds were specifically earmarked for programs for students whose needs were previously unmet. At the end of three years, continuation of the service was substantiated through written and verbal testimonials from professionals and users in the field, the submission of more referrals than were anticipated, success stories from students, and continual and

consistent access of the service. Due to the structure of the funding source and the nature of the funds (Part B of the Education for the Handicapped Act) being granted, the directions for planning the service were to some extent already in place.

Florida has been and continues to be very active in its commitment to meet the needs of augmentative communication users. The Florida State Plan (1) reports the state's proposals for use of Part B funds for fiscal years 1984-1986. Five percent of those funds were designated for administrative use, 75% for school district entitlements, and 20% for state projects. The development of CSEC was supported through receipt of a portion of the funds which were designated for state special needs projects identified by the State Advisory Committee. The Committee, which includes administrators of programs for handicapped children, handicapped individuals, parents, teachers, guardians of handicapped individuals, and state and local education officials, advises the FDOE on unmet needs of handicapped children within the state. Those needs are formatted by the Bureau of Education for Exceptional Students into project applications which are distributed to school districts for response. At the end of the project, call review teams, composed of persons with knowledge about the proposed project, review all applications, select the best proposal in each category, and award a predetermined funding amount.

INITIAL PLANNING STAGES

Prior to the 1980 project calls, a teacher of physically impaired students enrolled in the Orange County Florida Public School System recognized the special needs of nonspeaking, physically impaired students and initiated a program at his/her school to meet those needs. Although the program was limited to a self-contained classroom, a single school, and a single school district, it served as proving ground for the use of an interdisciplinary team to evaluate and design manual communication systems for the students. After the teachers, along with the help of the physical and occupational therapists and the speech-language clinician, experienced numerous successes with their efforts, a search for bigger and better approaches naturally followed. The 1980 project call was timely for the Orange County lead evaluation team. Since their expertise was clinical in nature, they required technical assistance for grant writing, budget preparation, and service planning and organization. A designee from the FDOE and the project development staff of the hosting school district (Orange County) assisted with grant writing and budget preparation, a requirement of the project call. An award was granted to the lead team and plans rapidly ensued for attaining the following objectives:

1. Implement a model evaluation center to assist in the selection of effective and appropriate augmentative communication systems for nonspeaking students ages 3 to 21.
2. Develop an evaluation center structure, operations, and procedures for evaluating nonspeaking students for the most effective and appropriate augmentative communication systems.
3. Determine the effectiveness and implications for use of various augmentative communication systems with nonspeaking students.

The FDOE designee, who was assigned to consult with the project for the first three years, and local university consultants were instrumental in identifying experts in the field of augmentative communication and researching the literature to obtain direction for planning and organizing the service. Persons knowledgeable in the field of augmentative communication were surveyed by phone to recommend national experts who could provide input into the development of services for CSEC. A two-day symposium was planned in which these experts provided information regarding developing a service delivery model; establishing administrative guidelines; determining the components of an augmentative communication evaluation process; identifying state-of-the-

art, commercially available communication aids; and defining the role of technology in the lives of nonspeaking individuals. Practitioners from all regions of the service area were invited to participate in the symposium and collaborate with the experts to produce a plan which would meet the needs of the students, parents, and teachers who would use the service; be commensurate with the state-of-the-art practices in augmentative communication; remain within the guidelines of the funding agency; and be feasible within the resources available to CSEC.

The symposium participants were challenged to address issues of concern which spanned the scope of national to local importance. A representative from the National Association of State Directors of Special Education, an organization which defines training of local and state-level personnel in the art of planning as one of its jobs, gave direction from an administrative perspective. Using data from a study conducted in Missouri, with the findings published in Assistive Devices for Handicapped Students; A Model and Guide for a Statewide Delivery System (2), the following issues were of primary significance: whether or not a state should initially have one or several centers, developing recognition for the massive amount of evaluation required to properly match a user and a device, funding for acquisition of recommended aids, and follow-up evaluations.

The clinical consultants, who were representative of education, occupational therapy, and engineering, were more pragmatic in their presentations, focusing on the evaluation process, its components, and the expected outcomes. The educator explained the goals and purposes of communication interaction evaluation, a theoretical basis for performing that evaluation, identified the persons who should be involved in the evaluation process, and pinpointed environmental factors which may influence an individual's interaction style. Concerns regarding optimal seating/positioning, organization of the space between the individual and the adaptive aid and interface, definition of motor access skills, and the influence of visual perception skills on aid usage were addressed by the occupational therapist. These motor/sensory concerns were subsequently assigned between the occupational and physical therapist on the CSEC evaluation team. The engineer focused on the role of technology in the lives of handicapped individuals, distinguished between various components of technical systems, and raised the awareness of symposium participants regarding speech synthesis, electromyography, and ocular control of aids.

PROGRAM DEVELOPMENT ACTIVITIES

Adhering to the recommendations of the symposium, as documented in "Report and Recommendations of Florida Model for Communication Systems Evaluation Center" (3), Florida supports one center in the provision of augmentative communication services. The symposium culminated in formulation of long- and short-term objectives, project timelines, and a focus for seeking and securing funding for continuation of the project beyond the first year. The first step following the symposium was to purchase a representative sample of electronic communication aids and devices. In the meantime, the lead evaluation team used the knowledge gained from the symposium to develop sample forms, inform the public and users of services, establish a referral mechanism, accept referrals, screen referrals, establish a pre-evaluation data collection process, develop on-site evaluation procedures, and schedule evaluations. The aids and devices were analyzed according to the motor, sensory, and language skills required to use them effectively as communication and instructional tools. During this analysis, evaluation protocols were written for each device in the CSEC inventory for the purpose of describing an acceptable means of explaining and demonstrating the operation of the device to a student. This work resulted in the publication of Volume III-E: Alternative Communication Systems for Non-Vocal Students (4), a resource manual for the education of exceptional students, at the end of the first project year.

The lead evaluation team met weekly to finalize pre-evaluation and evaluation data collection

forms and procedures. Following team critique, they sampled their ideas with eight students from a local school before beginning a more comprehensive evaluation schedule. Withstanding any major revisions, they selected and trained three additional part-time teams of professionals to use the procedures. These professionals critically used the procedures to provide service to the students who had been referred to CSEC from other areas of the state. Internal review of this kind resulted in few modifications to the original ideas, and a third-party review from a national expert was requested. The review was exemplary; however, modifications are continually made to maintain current practice. CSEC procedures are being replicated locally and nationally and are published in detail in Volume III-M: Procedures for an Interdisciplinary Evaluation of Nonoral Students (5).

A single administrator, with the assistance of a secretary, were the only full-time employees of CSEC initially. Part-time evaluation teams worked weekends on a rotational basis every two months. Since they were employed elsewhere full time, pre- or post-evaluation planning and study occurred on week nights. This did not prove to be the most effective means of service delivery. By the close of the second project year, an additional full-time administrator was added to provide follow-up services and manage the equipment inventory. In 1981, follow-up assistance, which had previously been provided through written and telephone communication, was now possible through an on-site visit to the local school district. A full-time evaluation team was hired in 1982, increasing the number of evaluations conducted per school year and the consistency of the evaluation team members. Outreach services, an effort to establish satellite centers in remote geographic areas, was begun in 1984 and continues to be modified and refined to best meet the needs of the service users. An additional objective for CSEC is training and updating of professionals and parents of nonspeaking students. This concern encompasses evaluation, follow-up, and outreach services and is foremost in the provision of in-service training and newsletter publications.

The staff of CSEC received its initial training from the lead evaluation team and has endeavored to maintain a high level of expertise by participating in professional development activities on local, national, and international levels; co-sponsoring training from national experts at the CSEC; and maintaining professional awareness through print, tape, and telecommunications media. The staff recognizes the importance of keeping abreast so the most current information can be shared with service users. Efforts in research are also being planned with the goal of adding to the limited amount of information regarding evaluation for, and implementation of, augmentative communication systems. CSEC has become a significant information provider by its selection as a model outreach center for Implementation Strategies for Improving the Use of Communication Aids in Schools Serving Handicapped Children, a project of the American Speech-Language-Hearing Association.

STRENGTHS AND WEAKNESSES OF THE MODEL

One of the apparent successes of this approach has been the input received from persons of multiple professional backgrounds, persons who will use the service, persons who will provide the service, and persons who will sponsor the service. A significant factor in the provision of the service was the appointment of local education agency (LEA) designees in each school district. The designees act as a liaison between the local school district and CSEC; distribute identification and referral information to personnel in the district; assist service users in implementing evaluation recommendation strategies, locating materials and resources, and identifying funding sources; collect pre-evaluation data; and organize on-site visits to local school districts. This input has continued throughout the life of the service and has resulted in steady increase in the demand for the service, heightened awareness of the field of augmentative communication, expansion of the service to meet the growing needs of the service users, increased financial support of the service,

and improved service to a low prevalence population. The program staff is always before professionals and the general public providing in-service training, technical assistance, follow-up assistance, and information of a public relations nature. This approach does not allow the enthusiasm of the service users to wane and it stretches the competency of those who interact with the augmentative communication device users on a daily basis.

Service users have formal and informal opportunities to critique the program through periodic feedback questionnaires, LEA designees, and encounters with program staff. Third-party reviews are used as deemed necessary as an internal means of maintaining a high level of quality in service provision.

The primary weakness of this plan has been the lack of a formal identification of the number of students who were in need of an augmentative communication program within the service area. The identification process has naturally occurred each year in that there has been a 9- to 15-month waiting list of students referred for the service. Although this identification process is not definitive in terms of long-term planning, it has two very positive effects. It justifies the need for the service and supports the request for additional funding increases to expand services in an effort to decrease the waiting time for students.

The effectiveness of this approach is the fact that the program has been successfully operating for six and a half years. During that time, 341 students have been evaluated, 86 have received follow-up services, local school district evaluation teams have been trained to perform manual communication system evaluations, and more than 180 professionals have been exposed to 10-hour in-service components concerning various aspects of augmentative communication. The FDOE strongly supports the continuation of the program and has demonstrated that support by making CSEC a permanent part of the Florida Diagnostic & Learning Resources System. This status makes CSEC available to handicapped individuals, parents, and professionals across the state to assist in enhancing their already fine programs.

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CHAPTER 6
THE PLANNING OF THE SERVICE DELIVERY SYSTEM IMPLEMENTED AT THE ROCKY MOUNTAIN REGIONAL CENTER FOR AUGMENTATIVE COMMUNICATION AT MEMORIAL HOSPITAL OF BOULDER

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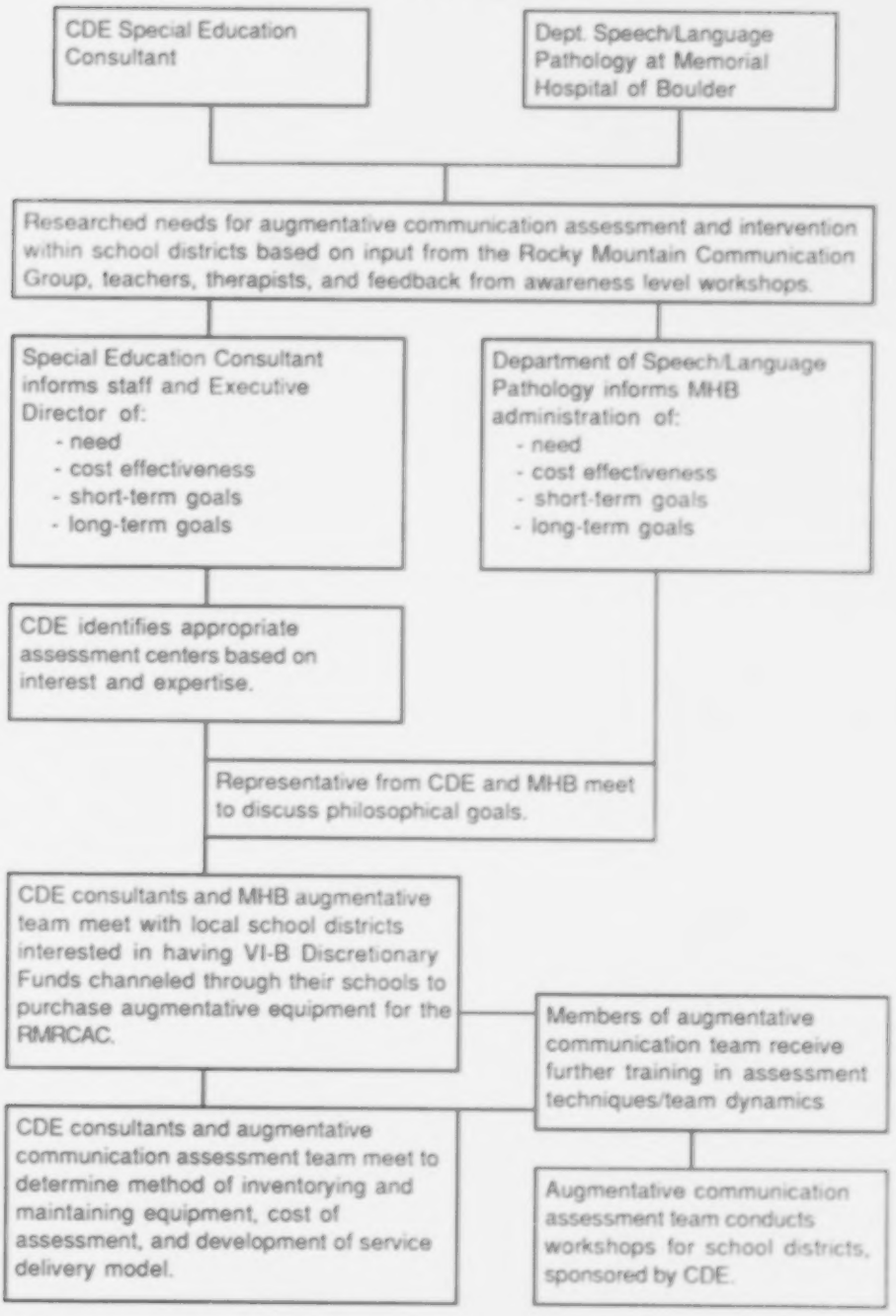
OVERVIEW

Memorial Hospital of Boulder is a 93-bed, acute care hospital with a 26-bed rehabilitation unit, located approximately 25 miles northwest of Denver, Colorado. Housed within this facility, as part of the Physical Medicine and Rehabilitation Unit, is the Rocky Mountain Regional Center for Augmentative Communication (RMRCAC). The need for a regional assessment center grew out of the growing concern that nonspeaking and severely dysarthric children were not reaching their maximum potential within their particular educational settings in the state of Colorado. Many teachers, therapists, and parents realized the difficulties in educating this population, but lacked resources and expertise in augmentative and alternative communication assessment and intervention. This was particularly true for those living and working in rural areas of the state and on the western slope. Grass roots efforts were slowly developing in the metro area and front range areas in 1980, but due to the mountainous terrain of the state, people living in the southern, western, and even central portions of Colorado found accessibility to the metro area on a regular basis difficult.

In 1980, an augmentative communication assessment program was implemented at Memorial Hospital of Boulder (MHB). It did not become the Rocky Mountain Regional Center for Augmentative Communication until 1984. Few children were served during the first years of the program. Most of the population seen consisted of adult head injuries, stroke patients, and those with degenerative neuromuscular diseases such as multiple sclerosis and amyotrophic lateral sclerosis. In 1981, the RMRCAC teamed up with the Colorado Department of Education (CDE) to develop a service delivery program addressing the augmentative communication needs of all school-aged children in Colorado, which included 178 school districts and 22 community center boards[1] with the potential of serving approximately 4,000 students.[2] This program continues to be based on the unique concept of public education cooperating with a local, private medical facility to address the communication needs of handicapped students. The two facilities have complemented each other nicely.

This paper will describe the sequence of events leading up to the development of a service delivery model for augmentative and alternative communication assessment and intervention within the schools. The sequence of events has been illustrated in Figure 1, and will be referred to as the "Planning Service Delivery Model." Issues discussed will in many ways overlap with those addressed in "Implementation of Service Delivery System at the Rocky Mountain Regional Center for Augmentative Communication at Memorial Hospital of Boulder" by Judith Haddow (1987), which is included in these proceedings (Section III, Chapter 5). These issues include the assurance of high quality evaluations, identification of assessment centers, the potential politics in-

FIGURE 1
PLANNING SERVICE DELIVERY MODEL


CDE Special Education Consultant
Dept. Speech/Language Pathology at Memorial Hospital of Boulder
Researched needs for augmentative communication assessment and intervention within school districts based on input from the Rocky Mountain Communication Group, teachers, therapists, and feedback from awareness level workshops.
Special Education Consultant informs staff and Executive Director of:
- need
- cost effectiveness
- short-term goals
- long-term goals
Department of Speech/Language Pathology informs MHB administration of:
- need
- cost effectiveness
- short-term goals
- long-term goals
CDE identifies appropriate assessment centers based on interest and expertise.
Representative from CDE and MHB meet to discuss philosophical goals.
CDE consultants and MHB augmentative team meet with local school districts interested in having VI-B Discretionary Funds channeled through their schools to purchase augmentative equipment for the RMRCAC.
Members of augmentative communication team receive further training in assessment techniques/team dynamics
CDE consultants and augmentative communication assessment team meet to determine method of inventorying and maintaining equipment, cost of assessment, and development of service delivery model.
Augmentative communication assessment team conducts workshops for school districts, sponsored by CDE.

CDE = Colorado Department of Education
MHB = Memorial Hospital of Boulder
RMRCAC = Rocky Mountain Regional Center for Augmentative Communication

volved in having the educational needs of students evaluated in a medical setting, the cooperation between the CDE and MHB, marketing, cost effectiveness, goals of developing such a program, the designation of funds, housing and maintenance of augmentative communication equipment, the accessibility to school districts of assessment sites, and the possibility of future replication of service delivery. Many of these issues are unique to Colorado and are not applicable to all situations.

ADDRESSING THE ISSUES

The key components in planning the service delivery system were the augmentative communication assessment team, and the administration at MHB, the CDE, the Rocky Mountain Communication Group (RMCG), and the individual school districts and service providers expressing a need for augmentative communication intervention. In 1982, the CDE began hosting augmentative communication awareness workshops around the state. Feedback from these workshops further substantiated the need for a regional assessment center.

The augmentative communication assessment team at the RMRCAC currently consists of two speech pathologists, two occupational therapists, one physical therapist, one rehabilitation engineer, and an on-call computer consultant. The RMCG is an advocacy group comprised of parents, teachers, therapists, friends, and those in need of, or already using, augmentative or alternative forms of communication. The CDE is the state's instructional agency responsible for monitoring the quality of education and the administration of funds for public education programs. Representatives from the state included the supervisor and two senior consultants from the Special Education Services Unit.

The first task in establishing the RMRCAC involved educating and gaining the support of the hospital administration, the hospital's department chairpersons, and the CDE as to the need for an augmentative communication assessment team and the benefits that students could derive from this particular therapeutic and educational intervention. It was particularly crucial that the support of the state's special education directors be secured, as the preference of most directors is to have all evaluations completed in-district, using in-district personnel due to financial constraints.

Cost effectiveness was understandably a major concern of both parties. The hospital administration had to be shown that an initial investment of thousands of dollars in high-tech augmentative communication equipment, staff training, and marketing could develop into a useful and profitable endeavor. Department chairpersons had to be willing to allow their therapists nonproductive time (nondirect patient treatment time) to develop assessment protocols and expertise in their particular areas regarding augmentative and alternative communication. The CDE had to feel sure that complete assessment reports would be distributed to all concerned individuals. The RMCG, special education directors, and service providers were instrumental in informing the CDE and MHB of the types of services needed and the populations that could benefit from the center.

After notifying the CDE of the hospital's intent and ability to provide services for nonspeaking children, a committee was formed from representatives of MHB and the CDE to explore the needs, philosophies and goals of both organizations. Cooperative efforts were discussed regarding the designation of funds for the purchase of equipment and continuing education of the augmentative communication team, the housing and maintenance of equipment, the cost of augmentative communication assessments, and the generation of monies to cover these costs.

Both agencies agreed on the tremendous need for specialized services for potential augmentative communication users in the schools. Both agencies also agreed that there were very few teachers or therapists in the state with expertise in the area of augmentative and alternative communication assessment and intervention. The CDE had recently begun to receive requests from parents wanting their children assessed by facilities as far away as New Mexico and Wisconsin, as their assessment needs were not being met in the state of Colorado. Most speech and language therapists in the public schools and community center boards are overwhelmed by heavy case loads and diverse diagnoses. Few have the time or resources available to them to gain extensive experience in augmentative and alternative communication. Until recently, there have been few courses offered on this subject; however, philosophies are changing. At the present time, there are approximately 60 colleges and universities in the United States that offer graduate courses in augmentative and alternative communication. This is double the number offered five years ago.[3] Generally, most information that teachers and therapists know about this field has been learned on their own time, through an occasional workshop and reading materials purchased at their own expense. Even if there were therapists with adequate experience in augmentative and alternative communication assessment in-district, the variety of equipment necessary to successfully evaluate a student's augmentative potential is costly. The updating and maintenance of several pieces of sophisticated augmentative communication equipment can cost several thousands of dollars annually. This equipment, if owned by a school district cannot usually move out of the district, so the number of students benefiting from this technology is limited. This would mandate that each district wanting to provide their own augmentative communication assessments, replicate service delivery by spending thousands of dollars in staff training and equipment.

INITIAL PLANNING STEPS

Because of the above issues, the CDE opted to address the need for augmentative communication services to the schools in a three-phase plan. Phase I was to be the identification and designation of specific augmentative communication assessment centers within the state.[4] It was planned that Phase II would be the inservicing of all interested staff and parents within the state in augmentative communication strategies. This was to ensure that recommendations made by the assessment teams would be understood and followed through within the child's classroom. Phase III was identified as the eventual training of additional assessment teams in certain geographical locations around the state. This paper will concentrate on the planning of Phase I and touch only briefly on Phases II and III.

Comprehensive assessments of children in need of augmentative and/or alternative communication are costly. Expenses vary according to the child's diagnosis and particular needs. For example, many nonambulatory children with cerebral palsy must have seating and positioning addressed prior to a recommendation for a communication system. Maximum stability and functionality with the least amount of pathology is crucial to successful augmentative intervention.[5] Determining the best means of seating, positioning, communication and access of communication (i.e., switch placement, scanning versus direct selection, etc.) can be extremely complicated. Children in need of this type of assessment fall under the category of "difficult to assess" in Colorado, and are eligible to be evaluated through PL 94-142 monies, labelled "Difficult to Assess Funds."[6]

The CDE initially considered purchasing various pieces of augmentative communication equipment and housing them at their state offices. Concerns arose, however, regarding its inventory, maintenance, policies and procedures for borrowing equipment, and the overall quality of the augmentative communication assessments if the equipment was available for purposes of assessment to all teachers and therapists, regardless of experience and expertise in the field of augmentative and alternative communication.

It soon became evident to both parties that another plan was needed. It was eventually agreed that the CDE would purchase $8,500 worth of augmentative and alternative communication equipment through the Boulder Valley School District, to be housed at the RMRCAC. In essence, the Boulder Valley School District purchased the equipment and was reimbursed by the CDE through VI-B Discretionary Funds. It was agreed that in return, the RMRCAC would inventory and maintain the equipment as well as provide a 15% reduction in the cost of any augmentative communication assessments covered by "Difficult to Assess Funds." The Boulder Valley School District was free to borrow said equipment for any student in their district. A portion of the VI-B Discretionary Funds was used to further educate the RMRCAC assessment team. Memorial Hospital of Boulder committed $4,500 to the first year's augmentative communication budget, bringing the total amount to $13,000. The following paragraphs were taken from the letter of agreement between the CDE and MHB.

> Boulder Memorial Hospital agrees to reimburse $5,000 of the $8,500 provided by the Colorado Department of Education (CDE), Special Education Services Unit, through the use of State Allocation Funding (94-142 monies) for the purchase of augmentative communication equipment. This amount will be subtracted from services rendered over the three-year period at the rate of $1,666 per year. This will apply only to the augmentative charges on children receiving "Difficult to Assess Funding" from the CDE. The discount will be at a rate of 15% per patient or as CDE determines. If a patient's charges exceed $800, the additional amount will be divided between the Hospital and CDE; and CDE's portion will be subtracted from the $1,666 per year. In addition, the Hospital agrees to provide all repairs on equipment and at the end of five years, the equipment purchased with these funds will be placed in a loan bank of augmentative equipment run by Boulder Memorial Hospital, Department of Speech Pathology and Audiology.
>
> Below is a six-step summary to aid in illustrating the normal sequence of an assessment from beginning to completion.
>
> 1. Assessment request by the CDE or home school district.
> 2. Information request by RMRCAC of home school district regarding student's skill level.
> 3. Assessment completed at RMRCAC or in home school district by RMRCAC assessment team.
> 4. Results and recommendations sent to home school district and student's family.
> 5. Reimbursement:
>   a) RMRCAC invoices home school district for assessment, less 15%.
>   b) Home school district requests reimbursement from the CDE through "Difficult to Assess Funds."
> 6. Follow-up by RMRCAC of student for minimum of two years.

SUMMARY

The service delivery system agreed upon by the RMRCAC and the CDE addresses several problems unique to Colorado. Input from various sources was crucial in planning the system. Those sources included the state special education directors and their respective teachers and therapists,

the parents of potential augmentative communication users, the students themselves, and a statewide advocacy group, the RMCG.

Phase I, the identification of augmentative communication assessment centers around the state, addresses the need for appropriate identification and education of nonspeaking children. Because the augmentative communication team is able to travel, any school district in the state can take advantage of the program. Because of the mountainous terrain and variable weather conditions, especially in the winter months, it is usually more cost effective to fly to assessments that are more than 200 miles away.

The team tries to schedule several evaluations in a 2- to 3-day period within the same school district, or in conjunction with a neighboring district, to lessen travel expenses. Conducting the augmentative communication assessments within the student's educational setting will in many ways fulfill the needs of those people working with the child regarding awareness of augmentative and alternative communication options and therapeutic interventions. It allows for high quality assessment with periodic follow-up by the evaluation team, and offers a support system for the students, their families, and school personnel involved in their treatment. Because the RMRCAC follows all children assessed for a period of at least two years, the team is in contact with the student's teacher, family, therapists, principal, and/or special education director on an "as needed" basis. This has been particularly beneficial to school districts outside the Denver metro area.

Phase II, the in-servicing of school personnel, helps teachers, therapists, and parents understand the unique needs of the augmentative communication user, as well as the various prerequisites needed for successful intervention. Phase II was planned to assure that the requests for assessments through the "Difficult to Assess Funds" were appropriate and that recommendations made by the team after an assessment was completed would be carried through. It has also provided the augmentative communication assessment team with a clearer understanding of both the child's communication needs and those involved with him or her at school and at home. Augmentative communication awareness workshops are frequently held in various locations around the state. These workshops are sponsored by the CDE and are usually conducted by members of the augmentative communication assessment team at the RMRCAC, as well as other facilities that have since been identified as assessment centers. These small workshops have served as a catalyst for a very effective information networking system within and between all portions of the state. Phase III, the training of additional assessment teams in specific geographical locations around the state, has just been initiated and cannot yet be discussed with any accuracy in this paper.

The planning of the service delivery system illustrates few problems. A few obstacles became clear when the service delivery system was developed and implemented. The agreement between the CDE and MHB has been mutually profitable. Because of the CDE's initial investment, the hospital has been able to build up its referral base and is now serving both an inpatient and outpatient augmentative and alternative communication case load, in addition to assessments through "Difficult to Assess Funds." This undertaking has allowed MHB to plan for a current budget of $40,000 in augmentative communication equipment. The state continues to have their assessments discounted 15%, the RMRCAC is able to assess these children with a wider variety of equipment, including dedicated communication devices, environmental controls, and microcomputers with appropriate educational and communication software.

Since the planning of this service delivery system, several other agencies and private therapists have identified themselves as augmentative and alternative communication assessment centers. Because there is no regulatory board to guide the consumer in what constitutes a "qualified" augmentative communication assessment center and/or therapist, the CDE has found it increasingly

difficult to officially endorse the skills of one individual or assessment team over another without appearing preferential in their referrals.

The planning of this service delivery system could just as easily have occurred between the CDE and interested school districts with an available and qualified assessment team. However, since few districts can afford the time and expense involved in such an endeavor, the planning and subsequent development of the service delivery system for augmentative and alternative communication between the CDE and MHB has proven to be a practical and cost-effective model.

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ORGANIZATIONAL ADDRESSES

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Penrose Hospital
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Rocky Mountain Communication Group
P.O. Box 4829
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FOOTNOTES

[1] A specialized school for the multiply handicapped. A community center board falls under the auspices of the Colorado Department of Education.

[2] This is the total number of students within the state education system identified as multiply handicapped. Not all of these students require augmentative or alternative communication intervention.

[3] Personal communication with Sarah Blackstone, Ph.D., Project Director, Communication Aids Project, American Speech-Language-Hearing Association, March 1987. This number is based on graduate-level courses in speech technology.

[4] Penrose Hospital in Colorado Springs was also identified as an augmentative communication assessment center and developed a similar agreement with the CDE.

[5] A. F. Bergen, R.P.T. & C. Colangelo, M.A., OTR. Positioning the Client with Central Nervous System Deficits. Valhalla Rehabilitation Publications, 1982.

[6] Procedures to access these funds are described in "The Implementation of Service Delivery System at the RMRCAC at MHB," Haddow (1987).

CHAPTER 7

THE MINNEAPOLIS PUBLIC SCHOOLS AUGMENTATIVE COMMUNICATION PROGRAM PLANNING MODEL: AN ASHA MODEL OUTREACH SITE

PRESENTER: Deanne Magnusson, Ph.D.
Coordinator, Speech-Language Programs

INTRODUCTION

The purpose of this conference is to develop a management plan for the service delivery of those students who might benefit from an augmentative communication system. This presentation will present as described in management literature, a brief synopsis of planning definitions, the characteristics of successful planning models, and the planning strategies implemented by the Minneapolis Public Schools for developing an augmentative communication program.

DEFINITIONS OF PLANNING

Waltman (1981) says planning is an organized attempt to establish goals and priorities, estimate future contingencies and resources, consider alternatives for matching resources with goals, and devise actions that will maximize the realization of these goals. According to Bozeman (1981), planning is a management tool which will help the organization adapt to change, while Heryla (1981), purports planning is managing change. According to Corbin (1981), strategic planning reflects long-range, overall goals while operational planning reflects short-term objectives. In Ferguson's (1981) view, planning recognizes the dynamic nature of the organization, and provides the format for accommodating orderly organizational change. Planning in Ferguson's view, is a process for deciding upon a course of action in order to implement change. Planning is directional, and establishes goals and guides for action. Ferguson feels planning is a vital management function which provides for conceptualizing the future in a disciplined manner.

Advantages of Planning: Why Plan?

There are many approaches to planning, ranging from broad, conceptual, philosophical perspectives to narrow, specific techniques or tactics. If there is no specific purpose, planning tends to be diffused, nondirected. Planning will maximize the effective use of resources. As King (1978) states, planning eliminates the duplication of effort, and builds momentum to overcome obsolete patterns; the facts and opinions developed during an organization's planning process increase the organization's knowledge and in turn this increased knowledge often leads to improved effectiveness.

Parameters of Successful Planning

Ferguson (1981) states that to be effective, the planning process must:

- be information based,
- involve all decision makers,

- have institutional commitment,
- contain measurable, obtainable objectives,
- evolve from a logical, consistent structure,
- convince people the plan will make them perform better, and
- establish accountability.

According to Van Ausdle (1980), the factors considered the most significant for enhancing planning effectiveness are: commitment of "top level" leadership, understanding the institution's mission, broad institutional participation, is information based, evaluates results, and provides staff with planning expertise. Bozeman (1984) suggests the success of planning relates directly to leadership support. He states that in successful planning there must be desire, commitment, communication, sufficient time provided, and that group and individual politics must be neutralized.

Components of Various Planning Models

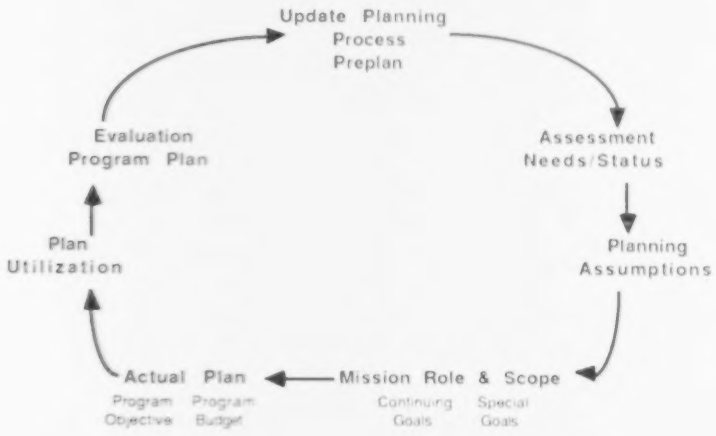
Van Ausdle (1980) in a paper presented to the American Education Research Association reported that the results of a survey of planning efforts at 32 colleges identified the most essential components of planning as including:

- a mission statement,
- assumptions,
- a goal statement, and
- measurable objectives

Edwards (1983) states that an organizational change model includes:

- recognition and definition of problems,
- definition of goals,
- development of change strategy,
- implementation strategies,
- collection and analysis of data,
- measurement/evaluation of results, and
- revision of strategies based on evaluation of results

Van Ausdle (1980) suggests the following planning cycle:



In summary, the parameters of successful planning models reported in the literature include the following common characteristics:

- expertise is obtained and utilized,
- recognition and identification of the problem,
- definition of goals, objectives,
- development of a mission statement,
- development of change strategies,
- implementation of change strategies,
- evaluation and modification based on data,
- commitment of leadership and involvement of decision makers at all levels of the organization, and
- a planning cycle is established and implemented.

Characteristics of Unsuccessful Planning Attempts

The common characteristics of unsuccessful planning attempts reported by various planning experts are:

- lack of commitment on part of leadership,
- purpose for planning is not clear,
- wrong problem identified, and
- appropriate decision makers are not included in the planning process.

THE MINNEAPOLIS PUBLIC SCHOOLS PLANNING PROCESS TO DEVELOP AN AUGMENTATIVE COMMUNICATION PROGRAM

Overview of Minneapolis Public Schools

The Minneapolis Public Schools is a large, urban school district serving approximately 39,000 students. The Speech- Language Program functions as a service within the district's Special Education Department to provide for the assessment, diagnosis and training of those students ages 3-21 who are identified as communication handicapped, including those students who may need an augmentative communication system to optimally interact within the student's classroom, home, social and/or vocational environments. Administrative responsibility for the Speech-Language Program is assigned to the speech-language coordinator who reports to the Assistant Director of Special Education.

Prior to 1984, there was no systematic planning, or policies and procedures articulated to address the needs of students whose communication might be facilitated by an augmentative communication system. Service delivery options to these students was primarily limited to instruction in the use of symbol systems such as sign language, Bliss Symbolics, or communication boards. This service was provided to a relatively small number of communication disordered students with severe physical and/or cognitive limitations.

The Emergence of a Planning Strategy to Develop the Minneapolis Public Schools Augmentative Communication Program

In view of recognized student needs, and the emergence of increased technology, a commitment perpetuated by the speech-language coordinator was made by special education administration to

plan and implement a comprehensive multidisciplinary program, including staff training, to more effectively service those Minneapolis communication handicapped students, ages 4-21, with no, or very limited, oral communication who might benefit from an augmentative communication system. A planning strategy was developed by the speech-language coordinator which included the following objectives:

Objective	Person(s) Responsible
1. Determine current best practices by reviewing the literature and contacting the existing school, agency, hospital and university programs on a local, state, and nationwide basis.	Consultant and speech-language coordinator
2. Identify resources for technical assistance.	Consultant, speech-language coordinator, representative of speech-language, OT, PT staffs
3. Identify potential augmentative user demographics.	Speech-language consultant with assistance from MIS coordinator, speech-language staff
4. Survey and compile a list of communication aids, high technology equipment, available on market.	Speech-language consultant
5. Develop a mission statement.	Speech-language coordinator. Reviewed by director and assistant director of special education, and representative multidisciplinary staff.
6. Design systematic assessment, field test procedures.	Speech-language coordinator, speech-language consultant, representative multidisciplinary staff, university consultant, agency representative.
7. Design a service delivery model which reflects continuum of service and environmental interaction philosophy, i.e., 1:1 classroom recreational/ community sites	Speech-language coordinator; reviewed by special sites coordinator, representative of building administration, speech-language, OT, PT, social work staff
8. Develop program funding policies for acquiring equipment for student augmentative system uses.	Speech-language coordinator, director of special education, contracting school district personnel, review with third party reimbursement-representative
9. Identify training needs for multidisciplinary professional, paraprofessional staff, parents, advocacy group personnel.	Speech-language coordinator, speech-language consultant, representative parents, advocacy group personnel
10. Design a data collection/ analysis process for augmentative program evaluation.	Speech-language coordinator, special education evaluator, university consultants
11. Identify necessary resources for staff allocation, training, equipment, acquisition, etc.	Speech-language coordinator, assistant director of special education, district technology coordinator

Objective	Person(s) Responsible
12. Develop an augmentative program budget	Speech-language coordinator, assistant director of special education
13. Develop implementation strategies.	Speech-language coordinator, representatives of multidisciplinary staff, site principals and/or coordinators.

A speech-language consultant was employed to assist the coordinator of speech-language services in the planning and implementation process. The estimated timeline for development and implementation was three years.

Planning Results

Planning efforts have resulted in the development and implementation of a comprehensive augmentative communication program to service those communication handicapped students, ages 4-21, who might benefit from an augmentative communication system. We have been selected as a model outreach site for exemplary practices in augmentative communication by the ASHA Department of Education grant project for Delivery of Services to School Age Children Needing Communication Aids.

As reported in the literature, and essential to the development and implementation of the Minneapolis Public Schools' Augmentative Program, successful management planning strategies necessitate:

- commitment of administrative leadership;
- involvement of decision makers at all levels of the organization, establishment of a program philosophy;
- goals and objectives, development of funding strategies for acquisition of resources; and
- communication of program policy and procedures to school, parents, agency personnel, and consumer groups.

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SECTION TWO: FUNDING FOR ASSISTIVE DEVICE PROGRAMS AND EQUIPMENT

OVERVIEW

This section addresses two different aspects of the assistive device program: funding for service delivery and funding for the purchase of equipment.

Acquiring funds to initiate and implement a service delivery program can be a very complicated process. Securing a funding source may involve several years of planning and collaborative involvement among several agencies, or it may require that a single state agency obtain funds by responding to requests for proposals from state and/or federal agencies. Acquiring funds for equipment purchase, on the other hand, occurs after a program has been initiated and specific client needs have been assessed and/or evaluated. The information that follows explores available funding models used by various programs. Three aspects of funding include:

1. Insurance: Medicare/Medicaid;
2. Other outside parties: organized efforts to approach local community/business funding;
3. State Education Agency, Local Education Agency and other state agency funding.

The questions listed below reflect some of the issues relative to funding.

1. Whose responsibility is funding?
2. What type of budgets are reasonable in the provision of adaptive technology services?
3. Is PL 94-142 funding reasonable and/or necessary? Is it adequate?
4. What are the most appropriate sources of funding to purchase equipment?, and who is responsible for obtaining the funding?
5. With scarce resources, how do you allocate the limited funds? Six children may need $1,000 devices, and one child may need a $6,000 device. Who gets the funding?
6. What are the best ways to fund the administrative costs?
7. Regarding third-party payers: Do LEAs (SEAs) have the authority to recommend third-party funding?
8. How do you access Medicare or Medicaid funding?
9. If the LEA recommends a device through insurance and the cost of the insurance policy consequently increases, is the LEA responsible?
10. What is the best way to approach the private sector for funding assistance?
11. What is the responsibility of the LEA in regard to environmental control? For independent living at home?
12. Can vocational rehabilitation be involved in all cases to provide high-tech devices for graduating students?

The chapters in this section address these issue questions. A summary of each chapter is provided below.

Richard Dodds works with Rehabilitation Technology Services at United Cerebral Palsy Association of New Jersey. Dodds' discussion provides suggested steps one might explore during the initial stages of acquiring funds. He recommends an eight-step process that will assist planners in organizing information to respond to proposal requests. In conclusion, Dodds provides a list of federal and private agencies where planners may start.

Dr. Marilyn Buzolich has established a private service, Non-Oral Communication Services, which serves individuals in the San Francisco area. Her discussion focuses on issues related to the acquisition of funds to assist clients with the cost of assessment and securing equipment. Buzolich outlines a "creative funding strategy" that provides suggested steps applicable to working with various service agencies who offer financial assistance dependent upon client needs and qualifications.

Carol Cohen is Director of Adaptive Services, Schneier Communication Unit at United Cerebral Palsy of Syracuse. Cohen suggests that the funding process should take into account four components:

- support for the site including material and equipment purchase,
- client assessment and training sessions,
- client owned and operated systems, and
- research and design of new products

Cohen provides a schematic description of the funding model at the Schneier Communication Unit and offers suggestions as to how this functional and pragmatic approach may be implemented.

Anna Hofmann, with Phonic Ear, Inc., provides an insightful discussion of funding issues that focus primarily on Medicaid, Medicare, and insurance agency sources. Hofmann uses case-study examples to illustrate mistakes commonly made when applying to insurance companies for financial assistance to purchase equipment for clients. This discussion provides several useful suggestions that can make the difference between an approved or disapproved application. Appended to this section is a "Funding Sources Check List" to assist in identifying likely funding sources.

Penny Parnes is Director of Augmentative Communication Services at Hugh MacMillan Medical Centre in Ontario, Canada. She discusses the role of the Ministry of Health in establishing the Assistive Devices Program. Parnes explains that funding for individual equipment is on a "shared basis" between the Ministry of Health and the individual and is based on the extensive "approved list" of devices that are eligible for funding. The strengths and weaknesses of this type of program are also provided.

CHAPTER 1

FUNDING ASSISTIVE DEVICE SERVICES AND INDIVIDUAL EQUIPMENT

PRESENTER: Richard Dodds
United Cerebral Palsy Associations of New Jersey

INTRODUCTION

Assistive devices refer to equipment that can assist an individual in the areas of mobility, communication, environmental control, and activities of daily living (such as bathing). Mobility equipment such as walkers and manual and power wheelchair are all tools to allow independent travel throughout one's environment. The use of adaptive devices such as environmental controls enable appliances and lights to be switched on and off. Equipment used in activities of daily living may include adapted spoons or automated feeding devices. Augmentative communication aids represent the majority of assistive devices currently being requested for school age children. These communication aids can allow someone who is verbally impaired the ability to communicate through print or synthetic speech. These devices can also serve as a pencil and paper for individuals who are physically unable to write using traditional methods.

The service associated with assistive devices may include presentations to educators as to how technology can assist their students with disabilities, information on what types of equipment is commercially available to serve those students, and evaluations of potential users to select the most appropriate device. This service may also include support to parents and educators on the use and maintenance of the device to ensure its most effective use.

The responsibility for the provision of assistive device services is a question which is often asked by parents, educators, and therapists. With many different types of equipment available, who and how does one decide which is the most appropriate device for a given individual? The service of evaluating potential assistive device users, and supporting the parents and staff working with the individual with the device, is an area that requires time and money.

Funding of services to provide evaluation, training, and support of assistive devices has come from a number of different agencies. United Cerebral Palsy Associations of New Jersey has a Rehabilitation Technology Services program which is funded through contracts with the State Division of Developmental Disabilities (DDD). This program offers training, assessment, consultation, and modification or fabrication expertise in all areas of assistive technology to individuals who are eligible for services through DDD. Local boards of education in New Jersey are responsible for the provision of equipment and services which will allow a student to adequately participate in an educational program. This typically takes the form of therapy services contracted on an individual-need basis. In Pennsylvania, federal dollars (PL 94-142) have been used to establish a statewide assistive device center which provides both services and equipment to school-age children and provides evaluations on a fee-for-service basis. These agencies have addressed the need for services and the responsibility to provide assistance.

The programs that have found ways of obtaining funding for these services have a similar beginning. Some have received funding through state or federal money and others through support from private agencies or institutions. The following is a description of where to begin.

ACQUIRING FUNDS FOR A CENTER

Typically, assistive device centers start with a reaction to a need; then an idea is conceived of how to address the problem. If there are materials, manpower, time and approval from some mystical higher authority (facility, administration), an assistive device center is formed. This would be ideal if money grew as easily as weeds in a garden, but this is not the case.

Devices mean equipment. Equipment means space, training, evaluation, maintenance staff, and follow-up. All this means money. Gone are the days (hopefully) when habilitation/rehabilitation professionals carried on with a missionary work ethic. All the specialists and consultants (doctors, lawyers, technicians, etc.) that we conduct business with are paid well for the services they perform. Why should occupational, physical, and speech therapists as well as teachers and rehabilitation engineers be expected to volunteer their services, accept a minimal wage, or be responsible for two or three jobs while only being paid for one? The money necessary for assistive device centers must reflect reasonable compensation for professional expertise, the cost of staff training and continuing education (conferences and seminars). The budget must also include the expense of purchasing (or leasing) and maintaining equipment, and the overhead costs of housing and support services (secretarial, copying, etc.).

RESPONDING TO PROPOSAL REQUESTS

Where does money for assistive device centers come from and how does it end up underwriting your programs? State, federal, and private agencies, as well as institutions and foundations, may have the dollars to fund assistive device services, but are unaware of the need and the strategies to implement the concept. These organizations offer funding to provide services through Requests for Proposals (RFP) or through annual grant cycles. These are viable funding sources and should be actively explored.

Funding starts with a request for money, which is in the form of a proposal, to the prospective funding agency. When writing this proposal, keep in mind who will receive the proposal:

State and federal agencies
Private agencies or institutions
Service organizations

Each of these funders have specific goals and interests. A proposal submitted to a vocational rehabilitation agency should stress employment; a proposal written for a department of education should stress the role of assistive devices in an educational program.

1. Knowing as much as possible about the end recipients of the proposal is extremely important. Illustrating how you will effectively utilize existing resources in their organization is a good way of demonstrating your knowledge of their agency.
2. With all this in mind, now comes the task of describing a model for proposed assistive device services. The first step is identifying a target population and describing its need for services. The target population can be an age group in a geographic area with similar or differing disabilities. Some examples would be: children attending school within the state of Pennsylvania; or individuals eligible for services through the Division of Developmental Disabilities within the

state of New Jersey. The needs statement should clearly define the areas of need and how those needs are currently addressed.

3. The next step is to describe the type of proposed service. Information, training, device loan, and equipment modification/fabrication are all services which could be provided, but these should directly reflect the needs statement. The rule when describing a program is that it should be understandable to someone not involved in the profession.
4. Include information on services you are currently providing. This establishes the fact that monies are not being asked for to begin a program, but to support and expand an existing one.
5. Include a timeline. A timeline documents anticipated progress and describes to a funding agency when they can expect results. Be realistic in your time estimates. A program that is providing services ahead of schedule is much better than one dealing with unanticipated delays.
6. Describe how you plan to provide services. Will you follow an existing model? If so, include documentation on that program. Illustrate how you will make use of existing resources. This is an effective way of demonstrating to a funding agency that their money is not being spent on reproducing services currently available in the area.
7. The last step in writing a proposal is to prepare a budget. A budget should include the cost of salaries, equipment, travel, building rental, as well as paper, copying, insurance, and pencils. Budgets should include all that is necessary to provide the best services. Do not be shy in the cost of items but do not exceed the dollar amount being offered. It may be difficult to assess the costs of items such as maintenance. One method is to contact the equipment vender and ask them how often they do repair, and the usual charge for the type of devices you plan to purchase.

Funding of service delivery systems is usually more difficult than obtaining money to build a facility to house them. It is difficult at times to quantify the change made in someone's life through the intervention of an assistive device. Careful documentation is necessary to receive continued support. Make sure your proposal answers all the questions presented in the RFP. Call the granting institution and ask questions regarding the type of proposal sought. Approach many potential funding agencies, not just one. Remember to stress to each that your program will be the best.

ACQUIRING FUNDS TO PURCHASE EQUIPMENT

The purchase of assistive devices is different from the funding of services because the equipment is obtained for a single individual. The responsibility for the purchase of this equipment initially falls on parents or guardians. Depending on their financial status the issue of who will pay for devices is referred to a third party. Typical third-party payers include Medicaid and insurance companies. Local boards of education have funded devices for individuals, when the equipment is necessary to provide an education. Many times, relatives or service organizations will assist in purchasing equipment. Some vocational rehabilitation agencies will provide funding for equipment which will assist in vocational placements or higher education.

There are many avenues to pursue funding but often those who might benefit from assistive devices go without them. What is the role of the educator when the need for equipment is not being met?

The first approach to the provision of equipment to an individual is the identification and documentation of need. This should be done through evaluation which includes parental involvement. Often parents are unaware of the types of devices which would aid their children. They may also feel that the equipment is too costly to purchase and maintain. If the parents are part of the need identification (they will often initiate the process) they will be less reluctant to investigate recommended funding sources.

Private insurance or Medicaid are often the agencies which provide funds for the purchase of assistive devices. Each will require significant documentation to justify the release of funds. This documentation should include the following:

1. information stating how an evaluation was conducted,
2. the types of equipment tested,
3. a description of how the recommended device will benefit the user, and
4. a physician's prescription for that device.

This information is then sent to the medical equipment distributor. If it is being submitted to Medicaid, the medical supplier will complete a prior approval form and submit the entire package of information to Medicaid, or directly to the insurance company. Upon review of the documentation, the requesting individual is notified whether the claim was accepted or denied.

When a child reaches the age of 16, vocational rehabilitation agencies will form a vocational plan for individuals found eligible for services. Assistive devices may be included in the vocational plan. The provision of that equipment would first follow traditional routes (insurance, Medicaid, or personal financing). Equipment may be provided by the vocational rehabilitation agencies if there is no provision through other funding methods.

Local boards of education are responsible, by law (PL 94-142), for providing equal education to each individual in their districts up to the age of 21. Assistive devices may or may not aid in obtaining an education. Some equipment may be of a medical nature (like a respirator) and would not be considered for funding by a local school board, while others such as a wheelchair, are not as clear. If a child needs a wheelchair to properly sit in class and to be independently mobile in a school setting, it can be argued that the wheelchair is necessary to secure an education. The same debate can be used to encourage schools to supply communication aids that may serve as the pencil and paper for physically disabled students.

CONSIDERATIONS

The key to providing meaningful documentation to an agency that funds assistive devices is a complete evaluation specific to the equipment in question. Private insurance companies often pay for evaluation of assistive device needs as they would pay for an annual physical. The same process occurs with boards of education and vocational rehabilitation agencies. Medicaid will also reimburse for evaluations but often at a rate which hardly begins to cover the costs. Evaluation services are provided through hospitals, private institutions, and some state agencies (New Jersey's Communication Resource Center or Pennsylvania's Assistive Device Center). The staff of the evaluation center typically includes an interdisciplinary team comprised of occupational, speech and physical therapists as well as social workers and rehabilitation engineers.

After a device has been selected and purchased, issues regarding repair and maintenance arise. Equipment purchased locally receives support from the vendor, who is in turn supported by the device manufacturer. This system of product guarantees is one of the best reasons for the purchase of well-tested and manufactured equipment. A volunteer who has the technical abilities may offer to construct a device at a minimal cost. This device when completed may or may not fit

the need of the individual. In the event this prototype equipment breaks, who is responsible for fixing it? Commercially available assistive devices are not inexpensive, but one is also purchasing the guarantee that the equipment will continue to operate.

Funding for services and devices is becoming more and more popular as service providers become creative in their programs and in their search for money to provide services. One program recently established in New Jersey's Monmouth County is a loaner library of communication aids. The loan center is housed in the Monmouth County Office of Social Services and supplied with equipment provided through the Bell Pioneers. This is an example of the type of program that can exist with a minimal commitment of funds while making excellent use of existing resources. Attached is a resource listing of 19 federal and private funding agencies which fund grant proposals for technology for disabled persons. The list was generated by Dr. Eydie Sloane (editor/publisher, The Sloane Report, P.O. Box 561689, Miami, FL 33256, 305/251-2199). The development of any program is limited only by one's view of what can be accomplished. Seeking funding for assistive device services and individual purchases requires flexibility and determination.

FEDERAL AND PRIVATE FUNDING AGENCIES

AMP Block Grant Center for Media and Technology
1101 Connecticut Ave., NW,
Suite 700
Washington, DC 20045

Apple Foundation for the Advancement of Computer Aided Instruction
20520 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
Grants in the form of equipment for innovative ideas

Artists in Education Program
National Endowment for the Arts
2401 E. Street, NW
Washington, DC 20506
(202) 634-6028
Arts in education

Carnegie Foundation for the Advancement of Teaching
1785 Massachusetts Avenue
Washington, DC 20036
(202) 387-7200
Elementary and secondary equal opportunity education

Commodore Business Machines, Inc.
Education Division
1200 Wilson Drive
West Chester, PA 19380
(215) 431-9100
Matching equipment for CAI, special applications, special populations, teacher training, parent training

Council of Foundations, Inc.
1828 L Street, NW
Washington, DC 20036
Provides direction for funding sources.

Ford Foundation
Howard R. Dressner, Secretary
320 E. 43rd Street
New York, NY 10017
(212) 573-5000
Elementary and secondary education, emphasis on roles of minorities, women, and parents in education

Foundation for the Advancement of Computer Aided Instruction
20863 Stevens Creek Blvd.
Cupertino, CA 95014

Fund for the Improvement of Post Secondary Education (FIPSE) FOB #6, Room 3123
400 Maryland Avenue, SW
Washington, DC 20202

Hollins College
Barbara Kurshan
Hollins, VA 24020
Lists sources for women and minorities in education

Howard W. Hazen Foundation
400 Prospect Street
New Haven, CT 06511
(203) 865-4121

Inmac Plus Sweepstakes
2465 Augustine Drive
Santa Clara, CA 95051
Prizes for winning disk programs

Interactive Sciences, Inc.
Public Relations
1010 Harriet Street
Palo Alto, CA 94301
(415) 855-8259

Manufacturers Hanover Trust Company
500 5th Avenue
New York, NY 10020
(609) 921-1126
Independent secondary school education

National Diffusion Network Division
U.S. Department of Education
Rm. 802, Riviere Bldg.
1832 M Street, NW
Washington, DC 20036
(202) 653-2000

National Endowment for the Humanities
Public Affairs Office
806 15th Street, NW
Washington, DC 20506
(202) 282-0256

National Science Foundation
Development in Science Education
11800 G Street, NW
Washington, DC 20550
(202) 282-7910
Research, matching funds

Tandy Educational Grants Program
Education Division
400 Tandy Atrium
Fort Worth, TX 76102
(800) 433-5682
Potential benefit to education

CHAPTER 2

CREATIVE FUNDING FOR AUGMENTATIVE COMMUNICATION SERVICES

PRESENTER: Marilyn Jean Buzolich, Ph.D.
Non-Oral Communication Services

OVERVIEW OF FUNDING

The issue of funding in the field of augmentative communication has always been a difficult one. However, with increasing public awareness and private and public funds available for the application of communication technology to the nonspeaking, we are enjoying a period of success. The key factor in the funding issue is to be knowledgeable of what is available for a given client and to persevere in the advocacy stage to obtain the necessary funds.

The present paper will discuss creative approaches toward funding for the purposes of 1) obtaining resources available to the client within the community to fund nonoral communication services and equipment necessary for intervention and 2) engaging a cooperative effort among the many social service agencies available to the client to meet his/her needs.

ISSUES RELATED TO FUNDING

It has taken five years for Non-Oral Communication Services (NOCS) to operate efficiently with respect to the funding issues, with a minimal time lapse between initial referral and initiation of services. It has taken time to learn the mechanisms of each individual private agency serving the client, familiarize the schools with how to effectively utilize the specialized services of a private agency, and engage the cooperative efforts of the available agencies in order to meet the client's many needs. Each agency has a particular philosophy and will fund specific aspects of the program but will not assume total responsibility. They are better able to get approval for services or equipment if they can demonstrate that other public and private agencies are contributing. This is an essential aspect of effectively utilizing the community resources for funding specialized nonoral services.

In order to carry out the creative funding strategy, cooperative social service representatives and assertive parents who put demands on the school system to have their child's nonoral communication needs addressed by experienced professionals are needed. The creative funding strategy can be applied in programs operating in an urban and suburban community more easily. In rural areas, resources are limited, but then again, so are the numbers of individuals requiring service. NOCS has serviced students in rural areas, and school districts assume a greater responsibility in meeting nonoral communication needs, particularly if pursued by an involved parent. While other social service agencies may not be readily available, it is still possible in the rural community to obtain funds for services and equipment from the schools alone.

Another consideration is the particular laws within each state. California has a new law which requires schools to purchase communication aids if they are educationally necessary. Education

Code Section 56771(d) provides for funds to purchase specialized books, materials, and equipment as required under the individualized education program (IEP) for each pupil with low incidence disabilities as defined in Section 56026.5 ("hearing impairments, vision impairments, severe orthopedic impairments, or any combination thereof"). This low incidence funding allows school districts to spend up to $500 per child on communication aids and more if many students will be utilizing the same aid. State support of nonoral communication and technology for the handicapped is crucial for carrying out this strategy. It is necessary to utilize the limited resources available to the extent possible. It is also possible to apply for grants to support your program in areas with limited funds for nonoral communication services.

OVERVIEW OF THE CREATIVE FUNDING STRATEGY

I. Initial Referral

A. Client is determined to be an appropriate candidate for nonoral communication services based on telephone interview with school/agency administrator, parent, therapist, educator, etc.

B. A list of public and private agencies providing services to the child is compiled, e.g., public school, United Cerebral Palsy, Muscular Dystrophy Association, etc.

C. Potential funding sources for initial assessment is determined on the basis of child's age, socioeconomic status, handicapping condition, etc.

D. Agency representatives are contacted and instructed regarding the child's need for nonoral services and an approximation of number of hours of direct service required to complete an initial evaluation.

E. Agencies are approached individually according to most- to least-likely potential funders.

F. Agency representative contacts NOCS to report outcome of purchase of service order request.

G. If service requests are rejected by all possible funding agencies, a client's advocate is contacted to assist in obtaining funds for nonoral services. The client's advocate determines what public agency is legally mandated to provide the necessary services and attempts to enforce this through a legal process such as a fair hearing.

II. Obtaining Funds for Equipment Purchases

A. Parents with the means to purchase the necessary equipment are encouraged to do so in order to encourage the social service agencies to continue to support service needs. Often, when parents contribute to the program, public agencies are much more willing to provide some support.

B. Efforts to select the most cost-effective system are made, particularly for individuals with a paucity of resources and few potential funding agencies. The determination of an appropriate communication system is made with consideration to the features that would best meet the client's needs. There are a number of systems sharing the same

features with a wide span of affordability. Devices are selected which meet the student's needs as well as the available resources.

III. Obtaining Funds for Services

A. Direct services to the client, if school age, are primarily obtained by the particular home public school district in which the child lives. These services, if provided by a nonpublic private agency such as NOCS, are reimbursed 70% by the State Department of Education to the school district contracting with NOCS. Therefore, school districts can obtain such services from a private agency if they are deemed educationally necessary by the interdisciplinary team within the school setting, at little cost to the home school district.

B. Indirect services such as consultation to school personnel and parents, preparation of materials, making communication boards or overlays, programming vocabulary, etc., are often provided by social service agencies outside of the public school system, e.g., Regional Centers, United Cerebral Palsy, Crippled Children's Services, etc. These agencies focus on the child's total program (home and school) and will often fund a limited amount of consultation to facilitate the child's optimal functioning across his primary settings.

Strengths and Weaknesses of the Funding Strategy

The strongest aspect of our funding mechanism is utilizing the multiple social services available to our handicapped clients in order to meet the full spectrum of their needs. Since NOCS is a fee-for-service agency, the agencies are educated with respect to what is required to evaluate and train individuals to utilize communication aids. The intensity and complexity of service needs are apparent and cannot be assumed by the classroom teacher or therapist. The primary barriers in implementing this strategy are 1) lack of information and understanding on the part of special education administrators; 2) lack of interdisciplinary team support for nonoral communication services; 3) fear on the part of school staff (especially speech pathologists) to recommend intensive language and communication services; 4) resistance of school staff in accepting recommendations of a private agency, particularly if recommendations call for increased services by ancillary staff; and 5) lack of knowledge in the field of augmentative communication by professionals and administrators.

IMPLICATIONS AND RECOMMENDATIONS

It is important to keep in mind that 1) funds are available within the community to meet the service and equipment needs of the nonoral population; 2) the student is unable to benefit from the educational setting without a means with which he/she can communicate; and 3) children who are nonoral are in a constant state of transition and will need to be followed professionally throughout their school years and beyond. There is no short-term solution to the problems of the nonspeaking.

A nonoral communication program interested in utilizing this strategy should:

1. Learn as much as possible about various social service agencies serving the needs of the speech handicapped population in your community,
2. Contact representatives in each agency and make an appointment to meet with them and discuss funding,

3. Conduct inservices for the various agencies to familiarize them with the nonoral communication as it applies to their clients,
4. Cooperate with the social service agencies by providing them with written documentation, letters, and any other information that will assist them in obtaining funds for a particular client, and
5. Attend program planning meetings conducted annually for each client receiving services to ensure that the agency includes nonoral communication goals and objectives on its individual program plans.

Since funding is the most crucial component in service delivery for the nonspeaking it is essential that professionals stay involved and advocate for a funding mechanism to support our service.

CHAPTER 3

PERSPECTIVES ON FUNDING

PRESENTER: Carol G. Cohen, M.S.
Director, Adaptive Services
Schneier Communication Unit
United Cerebral Palsy and Handicapped Children's
Association of Syracuse, Inc.

OVERVIEW OF TOPIC

Any discussion of service delivery systems for individuals with severe communication impairments must incorporate descriptions of strategies to obtain the necessary financial support for evaluation, prescription, training, research, and product development. Communication specialists generally agree that funding presents a constant source of frustration and is problematic for most professionals working in the field of augmentative communication. Enhancing communicative exchange through alternative and augmentative means is still a relatively unique approach to intervention, and challenges the practitioner to find novel ways to reimburse such endeavors.

Funding must be considered on a number of levels. Cohen (1986) has identified four distinct components of the funding process: 1) supporting the diagnostic/evaluation site including the purchase of equipment and materials; 2) client assessment and training sessions; 3) client owned and operated systems; and 4) research and new product design. The professionals responsible for submitting funding requests and developing narratives about client needs must have a thorough understanding of funding terminology, the nature and complexion of each third-party agency with whom they are dealing, and the distinct criteria used by each resource in the decision-making process. Finally, speech-language pathologists involved with augmentative approaches must adhere to a rigid set of ethical practices which will impact the nature and quality of the service delivery system.

DISCUSSION OF ISSUES

Funding the diagnostic/evaluation site is a primary consideration. Start-up and maintenance monies must be obtained in order to provide services to clients who are severely communicatively impaired. A considerable sum of money is needed to purchase assessment equipment and materials. Government grants of a federal, state, or local variety are appropriate candidates for seed money. Interested professionals should read the daily Federal Register, write to their Congressmen and Senators for information, and contact individuals in Washington, DC, or the state capitol as to available grant programs and special projects.

Individual client evaluations and subsequent training sessions are typically reimbursed through third-party programs including medical assistance, vocational resources, and educational institutions. Occasionally, the client or family will assume primary financial responsibility, particularly when trust funds have been created.

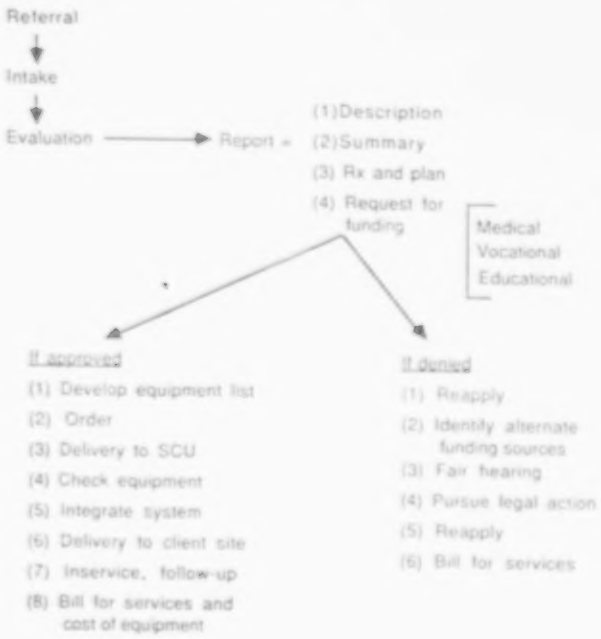
The most problematic component of client management and habilitation is the funding of personal communication equipment and related materials. There are a number of strategies which

can be employed to increase the likelihood of third-party funding approval. Medical assistance programs, bureaus of vocational affairs, and school districts are most often the agencies approached to purchase devices for individual client use. The professional team, client, and family must be prepared to pursue to the fullest extent all administrative and legal options intrinsic to the funding process and available to each applicant.

Funding for research and development of new products and approaches to treatment are traditionally supported by federal grants, charitable foundations, or local industry/corporations interested in the needs of the handicapped. It is important for administrators and communication specialists involved with assistive device service delivery to become familiarized with grant-writing techniques.

OVERVIEW OF SCHNEIER COMMUNICATION UNIT FUNDING MODEL

Below is a schematic of the funding model developed by the Schneier Communication Unit of the United Cerebral Palsy Center in Syracuse, New York.



Discussion of Model

The funding process depicted above is pragmatic and replicable (Blackstone, 1986) and has proven to be a successful approach to securing financial support for client assessments, purchasing assistive devices, and training communicatively impaired persons. The importance of the role of the administrative assistant cannot be overemphasized. It is the author's unqualified opinion that the communication specialist or augmentative communication team coordinator should not be responsible for the day-to-day mechanics involved in submitting requests for funding and following-up on client status. These activities should be executed by an administrative support person trained in funding protocol specifically, appropriate terminology, third-party agency regulations and procedure, and of course, cultivating and maintaining a close working relationship with individual agency representatives. The communication specialist or team co-

ordinator responsible for the communication plan, recommendations, and prescription, will monitor and oversee funding, but only on an indirect service level. There must be solid administrative (executive) support and budgetary allowances for the appropriate personnel in order for such a model to work. The energy and time demands inherent in this model are considerable and must also be addressed.

It is the author's impression that the Schneier model is an extremely functional, systematic, and successful approach to procuring necessary funds. It has been operational for six years. During the 1986 calendar year, the program was responsible for submitting requests to purchase assistive devices for 124 clients; third-party funding was obtained in 119 cases. Of the five remaining cases, three are pending disposition from other funding agencies and two have been resubmitted pending further clarification.

Implications, Suggestions, and Recommendations

The development of an effective model for funding assistive devices requires the smooth flow of many components. The service delivery process must be evaluated in its entirety, and the way in which funding acquisition fits into the total picture. The staff members, their roles and responsibilities, must be examined relative to the demands of funding-related activities. Are clients, professional team members, family, and friends, willing to take time out from their personal lives to tenaciously pursue all legal and administrative avenues? Personnel must be available to offer guidance and counselling to clients and family members on an as needed basis. Have local, state, and federal laws been assessed and reviewed thoroughly by those individuals involved with securing funds?

Successful funding strategies evolve and can only occur as part of an efficient and effective service delivery system dedicated to the total habilitation and lifelong management of communicatively impaired individuals.

REFERENCES

Blackstone, S. (1986). List of Submitted and Suggested Strategies for Model Outreach Sites. Implementation Strategies for Improving the Use of Communication Aids in Schools Serving Handicapped Children. Three-year project sponsored by the American Speech-Language-Hearing Association and the U.S. Department of Education. Information available from ASHA, 10801 Rockville Pike, Rockville, MD 20852.

Cohen, C. (1986). Total Habilitation and Life-Long Management. In S. Blackstone (Ed.), Augmentative Communication: An Introduction. Washington, DC: American Speech-Language-Hearing Association.

CHAPTER 4

FUNDING: HOW YOU CAN MAKE IT WORK

PRESENTER: Anna C. Hofmann
Phonic Ear Inc.
Mill Valley, California

In January, I received a letter from California Senator Pete Wilson thanking me for mailing him copies of ECHO ON. Now mind you, it was last May and November (1986) that he received ECHO ON. He's on the Special Committee on Aging . . . he wants my vote! Do you realize he is almost 4 months ahead of the rest of us in planning! Have any of you written your Congressmen thus far, or are you planning to educate them about the problem of funding before November 1988? You are very important to your Congressmen . . . they want your vote -- it's our chance to tell them what we expect from them to get our vote!

Let me give you a chronology of what has happened in this decade due to the efforts of advocates for the physically impaired. If you recall, 1981 was designated as the International Year of Disabled Persons. To me, that represented the kickoff for national and international awareness of the physically impaired. In addition, the U.S. Council in Washington created the Corporate Partnership Program and enlisted the interest, cooperation and participation of over 200 major corporations in the United States in developing programs for the physically impaired.

By November 1983, a ceremony was held in the White House by President Reagan to mark the beginning of the National Decade of Disabled Persons, 1983-1992. Thus, the recognition of the need for the physically impaired will have continuity with the support of the government and private industry and others with interest in the handicapped.

Back in the summer of 1980, the Senate Committee on Labor and Human Resources requested that the Office of Technology Assessment (OTA) conduct a study of technologies for handicapped individuals. By May 1982, copies of the full report were distributed to the Senate Committee on Labor and Human Resources and the President's Committee for Employment of the Handicapped. As a result of this report, a joint hearing of both the Senate and House occurred in Washington in late September.

From that report, a number of Case Studies were prepared. One that is of especial interest to us is Case Study 26, Assistive Devices for Severe Speech Impairment, which was released in December 1983. This case study covers the revolution in communication aids that has since changed the outlook for the nonspeaking population, its accomplishments to date, its promise for the future, and its problems.

And in July 1984, OTA released another report titled: Medical Technology and Costs of the Medicare Program. This report was requested by the Subcommittee on Health and the Environment in the House . . . and . . . the Subcommittee on Health in the Senate.

I want to take a moment to point out that the interest in technology and the handicapped is not limited to one segment of our legislators, but that it was the Senate that initiated the first report in 1980, and in 1984 both the Senate and the House in the second report.

The National Institute of Handicapped Research (NIHR) was established in 1978, and by 1980 invited business and professionals concerned with the physically limited to help them develop and implement a long-range research plan based on realistic needs, major concerns and significant problems currently being experienced by handicapped individuals in the United States. By 1982, NIHR announced its Proposed Funding Priorities for FY 1983. Probably the most significant one was:

> Development of effective technological communication aids to be used by persons who are unable to speak or communicate orally due to birth defects, cancer, stroke, or other neuromyopathies.

At the same time, the Department of Education (DOE) continued to pursue programs for education of the handicapped. I am sure you remember in 1984 the announcement that Secretary of Education T.H. Bell was going to make some massive cutbacks on education programs for the handicapped, only to follow with a withdrawal after over-whelming public protest.

While these federal bureaus were investigating technology for the handicapped, a consortium of manufacturers of sensory aids began a program to develop an amendment to the Social Security Act, designed to treat certain sensory and communication aids as medical and other health services, and also to secure Medicare/Medicaid coverage for the purchase of sensory aids. Unfortunately, the consortium made up of approximately eight small manufacturers of sensory aids could not command the clout that hundreds of constituents have, and thus the amendment died in Congress. But, if those of you from Pennsylvania and Minnesota were to ask Senator Heinz of PA and Senator Durenberger of MN if they remember S. 1115 "The Handicapped Independence Assistance Act of 1983", they will remember the many letters they received from professionals and parents Phonic Ear that encouraged them to write. But it was not enough.

In 1984, the federal government created a program to award funds to cities through Public Service Community Development Block Grant Funds. The purpose of the program was to support public facilities that were providing programs or services for the handicapped. The program is still in effect; I have attended meetings in California. Last February, Senator Lowell Weicker, Jr., Chairman of the Senate Subcommittee on the Handicapped, held a hearing directed toward the reauthorization of the Education of the Handicapped Act, PL 94-142 .

Back in 1985, a Forum on Telecommunications for Disabled People was conducted to focus on the problem of small markets as they relate to telecommunications useful to disabled people. By February 1986, the Forum met in Washington to focus Congressional attention to increase federal help, whether in subsidies or other forms.

In May 1986, OTA, at the request of Congress, completed another major study on "Technology and Aging in America." The first background paper released was titled "Hearing Impairment and Elderly People" and in this report was reference to the Handicapped Assistance Act of 1983.

In September 1986, I attended a meeting in New York. This group became known as a "Disabilities Industry Association" made up of representatives of the sensory aids industry as well as major manufacturers such as IBM and AT&T.

Then in October, President Reagan signed into law the Rehabilitation Act Amendments of 1986. And even the states are beginning to recognize the need and benefits of technology for the handicapped.

Early in 1986, the state of California passed a bill providing low incidence funding; that is, special funding to meet the needs of students who require special equipment to pursue their education. Through this program, a student will have full-time use of equipment until he leaves the school system.

In October 1985, the Governor of Minnesota announced the formation of an Issue Team to investigate the potential of high technology to improve the quality of life for Minnesotans with disabilities. By October 1986, he approved the recommendations made by the Issue Team, and Minnesota is on its way to implementing a statewide program. And of course, we all know about the Pennsylvania Bureau of Special Education and its Assistive Device Loan Program.

My reasons for this review are to point out that we are not starting from ground zero in our efforts to get better funding sources. There has been a slow evolution in activity at both the federal and state level and it is up to us to keep it alive and make it grow. We cannot do it alone . . . we need the help of the handicapped themselves and all those associated with them. And the next 18 months up to November 4, 1988, is our opportunity!

First, let's look at Medicare and Medicaid and insurance companies. I put them together because all look to one another for payment policy . . . they all have the same basic requirements, as indicated in the following chart.

Medicare	Medicaid	Insurance
Durable Medical Equipment (HCFA)		Medical items must pass three steps
Primarily and customarily used to serve a medical purpose	Primarily and customarily used to serve a medical purpose	Must be prescribed by a physician., i.e., licensed practitioner
Generally not useful to a person in the absence of illness or injury	Generally not useful to a person the absence of a disease, illness or injury	Condition of patient must be result of illness or accident
Can withstand repeated use	Capable of withstanding repeated use (durable) and is nonexpendable (i.e., hospital bed, oxygen equipment, wheelchair, walker, etc.)	Must be one of the covered charges of the policy
Appropriate for use in the home		

MEDICARE: HCFA's coverage instructions have no standing in law or regulation, so the contractors' compliance is essentially voluntary. The manual instructions, including the coverage index, appendix and letters to contractors, are usually considered interpretive rules, and thus not legally enforceable. I can vouch for that because I have been involved in four Medicare approvals . . . . one as recently as August 1986.

MEDICAID: This is a tough one because each state makes its own interpretation of the law. However, I know of applications that have been approved in one week and others that have taken a year, and sometimes more.

INSURANCE: I am very optimistic in this area. Back in 1980, coverage was the exception and not the rule. The key is "terms of the policy" -- it was then, and still is. But I see a trend in broadening the terms of the policy -- the insurance companies and industry are recognizing the benefits of technology and their rehabilitative results.

VOC REHAB, STATE AND LOCAL AGENCIES are regulated by local laws and budget constraints. However, there have been several successful programs. Examples are those I just cited in California, Minnesota and Pennsylvania.

PRIVATE FUNDING is a variable, but there have been cases where the Kiwanis, Rotary, Lions, Sertoma and private foundations have come forward with funds. In fact, there has been considerable interest by some of them to the "loan bank" approach. The Elks, for example, have a statewide loan bank in Alaska. United Cerebral Palsy in Idaho and Minnesota have set up loan banks in their respective states. And there are probably others I am not aware of.

Now that we know there is funding out there, the questions is . . . how do we get it? The first thing you need is a check list to be sure you have not overlooked any possibility. I created such a checklist because of the many phone calls I got from people who had no idea where to start. This list was designed strictly for sorting out funding sources . . . no medical history was necessary. The purpose was to think what sources had been utilized and what other possibilities there might be. It was surprising how many times people would respond with "I never thought of that."

Now that you have your sources, what is the first step. Usually you have some kind of a claim form to file. No matter who you are filing with, there are two points you must keep in mind . . . you must show that the device is:

- is medically necessary and/or
- will restore the patient to his best functional level

Those two criteria are as critical today as they were last year and the years before. Let me show you what I am referring to.

CASE A

This is a young man with severe cerebral palsy, athetoid type, with severe voice handicap. He has been using a HandiVoice 110 which, through nearly superhuman effort, he mastered. Obtaining a VOIS 130 would expand his social horizons, and extend his personality and his contact with the world immeasurably, and lift his psyche to a new level.

Item previously provided April 1982, HandiVoice 110. Meets medical needs of patient.

CASE E

Patient is a nine-year-old male with significant autistic behaviors, in addition to severe speech production disorder rendering him nonspeaking. His primary mode for communication is manual/visual communication. This is noneffective with others in his environment and most often his needs, wants, intentions, etc., are fruitlessly expressed which becomes a tremendous frustration for him. A Phonic Ear VOIS 130 would provide synthesized speech and a means of communication for him which would enable him to be understood by others and thereby function within his

environment. According to descriptive write-up of this patient, he seems to be developing some communicative abilities both manually and verbally. This should be encouraged and developed.

Now those cases are more than three years old, but I still see applications being written with the same approach. I say this because recently I got an application that included the doctor's prescription and a letter from the speech therapist. It was four pages, hand written, and let me quote from it:

> Patient is a 9 year old nonambulatory, nonverbal female. Medical diagnosis is cerebral palsy. Primary means of expression is a manual language board:
>
> - First board coded by Rhebus pictures
> - Re-coded for Blissymbolics
>
> MISTAKE #1
>
> Patient made the transition from one set of codes to the other easily.
>
> SP explained board has 100 symbols usable at home and school. Patient is able to use 2 and 3 symbols to sequence grammatically correct phrases. Her use of this system of communication is spontaneous.
>
> MISTAKE #2
>
> She is demonstrating emerging oral speech skills, attempting to complement her communication board with expressive speech.
>
> Patient is also demonstrating the ability to use the alphabet displayed on her communication board in order to spell words
>
> MISTAKE #3
>
> This strategy is helpful when words patient wants to express are not displayed as Blissymbols on her communication board.

The rest of the letter goes on to explain that having a VOIS 130 will give her more independence, fuller life, etc.

I don't know about you, but I think the persons filing this application are going to get a denial with a statement similar to the cases we just examined. You are probably thinking to yourselves, what should we say . . . what points should we emphasize and what should we avoid . . . .

First, let me emphasize some items that you should avoid . . .

First of all, do not assume that because Medicare, Medicaid or the insurance companies approved a device in your state, that all applications following will be approved . . . there is no such thing as "precedent setting." Let me explain:

Take Medicare: remember I told you I just had a claim approved. This is what the approval said:

> Claimant has requested a reconsideration of the Fair Hearing decision dated August 21, 1985. I have carefully re-reviewed the facts in the file and have determined that the VOIS 140 should be covered by Medicare Part B. It is not a "personal comfort item," it is required by the beneficiary as a prosthesis that, in fact, replaces a function of the body, "enabling her to be understood," does meet the requirements of Durable Medical Equipment and is not specifically excluded.

> The decision is rendered under the Supplementary Medical Insurance Benefit Provisions of Title XVIII of the Social Security Act. It applies therefore ONLY TO THE SERVICES AND CIRCUMSTANCES considered on the claim in question in this hearing decision only and does not create a precedent for any other Medicare claims or services.

Here is a Medicaid example. There was a case filed in one state that had many hearings before the final approval was given. And when it was, it said:

> A decision on whether the Phonic Ear HandiVoice is a covered item is set aside and approval is given as an EXCEPTION TO POLICY, on the basis that a SPECIAL NEED WAS ESTABLISHED.

Insurance Companies . . .Because Aetna, Metropolitan, BX/BS or whoever approved a case in one state does not mean that it will approve another in the same state or elsewhere in the United States. When it comes to insurance claims, it all depends on the terms of the policy. It is like buying a car -- you get what you pay for: if you want a car with all the special accessories, you pay extra for it. If you want an insurance policy that will give you extensive coverage, then you have to pay for it. My experience has been that most businesses have what they call major medical coverage, and in most cases that will cover a speech prostheses. But again, it depends on the terms of the policy and how you present the claim.

- Don't label the item as an education device, because neither Medicare, Medicaid nor the insurance companies will cover for that reason.
- Never give the impression that the item will be a convenience item . . .the examining officer will tell you that alternatives are available at much less cost.
- Never describe it as a communication tool or aid because they may say that it is not essential to improve the patient's MEDICAL CONDITION as required by law.

What then, when applying for funding, are some of the areas to think about to demonstrate need . . .

- It should be demonstrated that CP or similar disabilities are medical problems and the use of a speech prostheses would have therapeutic effect on the patient by reducing emotional and psychological frustrations. From this perspective, it can be shown that acquisition of a speech prosthesis involves the issue of medical care.
- It should be demonstrated that a speech prosthesis can be a motivational factor to increase the ability to communicate with others. With such increased functional use of the device, there can be perceptible lessening of release of anger and emotional frustration.
- If you think the client is employable, then demonstrate how a speech prosthesis will help him gain employment . . .this is especially effective if you are working through the Department of Vocational Rehabilitation.
- Keep in mind that cost if always a factor. Include in the application, a brief description of ALL the augmentative communication devices the client was tested for. Include the pros and cons of each device, price, and then state why the device was chosen. This, then, answers the possibility of denial because of the cost factor.

Too often you and parents are discouraged from filing for a device because you are told Medicare, Medicaid or insurance companies "won't cover a speech prosthesis." Some of you call the

local office and the clerk answering the phone, looks at the manual and tells you they won't cover it . . . and you believe it! That is probably the biggest mistake of all. You have to keep in mind that the clerk is not paid to give you medical judgment; the clerk only knows what the manual says. You must move up through the hierarchy and get to the decision makers. That means, FILE with every third party source that is liable for your client.

If after doing "all the right things" you get a denial, then appeal. I sometimes look favorably on a denial because now I have something I can specifically address. Everyone of those Medicare cases I referred to was denied, but were approved on an appeal. Recently there were some Medicaid cases that required legal services, and they also resulted in approvals.

When responding to those denials, be sure to keep in mind that your response must always be framed in terms of:

- medically necessary, and/or
- restoring patient to best functional level.

What's the outlook . . . ? I am positive.

But the disabled community must get organized. There has to be a unified effort. Sometimes we forget there are other lobbying groups that are bigger and fighting for the same means and ends . . . they just have a different name, i.e., the Veterans Administration and the elderly. We should work with them. They have augmentative communication problems as well.

Don't forget the major corporations that are hiring the handicapped. You as professionals and your patients can reach them far easier than we as providers. As providers, we appear to them as profit motivated; you as humanitarians.

This takes me back to where I started. You all have Senators and Representatives -- it is up to you to determine whether they will be elected. Make them aware of your problems -- invite them to your centers -- visit their local offices . . . . bring with you a handicapped person. Remember, Senator Pete Wilson is already contacting me for my vote in 1988.

And in closing let me say, I just learned that HCFA has agreed "that the Medicare coverage process should be one that is clearly delineated and available in writing to the public." I contacted HCFA -- they will publish that information early summer and will provide for a comment period. I hope I can count on you to respond.

Funding Bibliography

"Technology and Handicapped People," OTA, May 1982 Supt. of Documents, Washington, DC

Capitol Conference on Technology & Handicapped People, Washington, DC October 1982

"Case Study #26, Assistive Devices for Severe Speech Impairment," OTA, December 1983. Supt. of Documents Washington, DC

"Medical Technology and Costs of the Medicare Program" OTA, July 1984. Supt. of Documents, Washington, DC

"The Many Faces of Funding . . . .," 1981 - 1987 Anna C. Hofmann, Phonic Ear Inc., Mill Valley, CA

FUNDING SOURCES CHECK LIST

Patient Name _____ Sex: M F Year Born _____
Address _____ Disability/Medical Diagnosis:
City _____ State ____ Zip ____ _____
Telephone _____ _____
Patient status: ___ Mother Time of onset: Birth ____
___ Father If later, year ____
___ Son
___ Daughter
_____ Other (specify)

FAMILY STATUS

	Employed?	If yes: Where? (name of co.)	Group Insurance	Name of Insurance Co.
Mother	Y N	Y N _____	Y N	_____
Father	Y N	Y N _____	Y N	_____
Other _____	Y N	Y N _____	Y N	_____

Any family insurance? Y N Anyone member of a labor union? Y N
If yes: (name of carrier) _____ If yes: Who? _____
What union? _____

PATIENT EDUCATION

Attending school? Y N If yes: Elementary ___ HS ___ College ___ Other _____

PATIENT EMPLOYMENT

	If yes: Where? (name of co.)	Dates Employed From	To	Group Insurance
Employed? Y N	_____	_____	_____	Y N
Ever Employed? Y N	_____	_____	_____	Y N

PUBLIC SERVICES PROVIDED TO DATE

_____ Medicare
_____ Medicaid
_____ Veterans Administration
_____ Education for Handicapped PL 94-142/Section 504
_____ Vocational Rehabilitation
_____ Crippled Children's Services (CCS)
_____ Other (specify) _____

STEPS TOWARD SEEKING FUNDING

File applications with:

1. Public Services provided
2. Group insurance or private insurance
3. Labor union membership

If the foregoing do not provide funding, investigate non-public programs, i.e.:

- Corporate foundations: investigate local offices of large corporations
- Local businesses with benevolent funds for community programs
- Private foundations
- Volunteer agencies:
  - Kiwanis
  - Rotary
  - Lion's International
  - United Cerebral Palsy
  - Sertoma
  - Bell Tele. Pioneers of America
  - Elks
  - Knights of Columbus
  - Soroptomists
  - Optimists
  - ALS
  - Churches — especially patient's affiliation
- Advocacy groups for help/direction write for local representative name:
  - Closer Look, Box 1492, Washington, DC 20013
  - Pilot Parents, 3212 Dodge Street, Omaha, Nebraska 68131

Phonic Ear HandiVoice/VOIS

DEFINITIONS

MEDICARE is designed to serve everyone over 65 years of age and disabled persons under 65 years of age who have been entitled to receive Social Security disability benefits for a total of 24 months.

The program is not based on income, but is available regardless of financial need.

Medicare program has two parts:

Part A: Hospital insurance at no cost
Part B: Voluntary medical insurance at a monthly premium

Phonic Mirror HandiVoice/Phonic Ear Vois claims are filed under Part B.

MEDICAID is a joint Federal/State program to provide physical and related health care services to persons with low income. Disabled persons may be eligible for Medicaid on the basis of their income.

Eligibility is determined by claimants State program of public assistance. Generally, persons may be eligible for Medicaid if they are receiving welfare or other public assistance benefits or Supplemental Security Income or are blind or disabled.

Medicaid Services are available in all states.

VETERANS ADMINISTRATION The VA will fund any communication device prescribed for a person who has a "service connected" disability. Should the individual not have a "service connected" disability, funding may be obtained through the Prosthetics Evaluation Center in New York City for evaluation.

EDUCATION FOR HANDICAPPED Under the provisions of the Education for All Handicapped Children Act of 1975 (PL 94-142), your state and local school district must provide an appropriate elementary and secondary education for your disabled child from age six through 21. In those states mandating public education for children age three to five, PL 94-142 requires that disabled children of that age group be found and educated in the Least Restrictive Environment (LRE). This education must cost you no more than it costs parents of nonhandicapped children.

Final responsibility for implementing the Education for All Handicapped Children Act rests with the state education agency.

VOCATIONAL REHABILITATION All states have voc rehab agencies to help handicapped persons become employable, by providing a wide range of services, financial assistance, and training.

Expenses borne by the program will vary widely from case to case and state to state. An individualized plan for rehab is worked out for every eligible handicapped individual, through meetings of that individual and the counselors, to determine the individual's potential existing skills, and other resources.

The Federal Government provides extensive support to the states for voc rehab services. However, the services themselves are very individualized, and information useful to the individual must be sought at the state and local, rather than the Federal level.

CRIPPLED CHILDREN'S SERVICES (CCS) is a joint Federal/state program to provide medical and related services to handicapped children from birth to age 21.

All states must provide medical diagnosis and evaluation free for all children. (No state residency period is required before such services are provided.) The range and cost of additional treatment or hospital care services vary from state to state. All programs accept third-party payments such as Medicaid, Blue Cross and Blue Shield and other medical insurance.

DEVELOPMENTALLY DISABLED The developmentally disabled (DD) program makes use of existing services in health, welfare, education, and rehabilitation to provide for the long-range needs of people with developmental disabilities. These disabilities are defined as severe, chronic disabilities attributable to mental or physical impairment, which are manifested before age 22, result in substantial functional limitations in several areas of life, and require services over an extended period.

Availability of services will vary in all communities. Each state has a designated agency to administer the developmental disabilities program. Also in each state is a protection and advocacy office where DD people or their parents can turn if they do not find help in their communities.

INSURANCE Whether the insurance carrier is Blue Cross/BLue Shield or one of the private insurance companies, coverage for a communication device by a carrier depends upon the terms of the policy and its interpretation. Each case stands on its own; precedence does not affect the determination of coverage.

When filing an application for insurance coverage, it is important to include a prescription by a physician. In addition, documentation from an SP, OT, or PT to show need and how technology can improve the environment of the physically impaired.

A claim with good documentation and supportive facts will provide the insurance carrier with better decision making tools.

Claims filed with unions deserve the same detailed information.

NON-PUBLIC PROGRAMS To reach the various types of funding sources listed requires some research at the library, the telephone book, or contacting your local Chamber of Commerce to determine what sources are available and where they can be reached.

If your patient or family members have any affiliation with some of these groups, find out from them who you might contact.

Don't forget your local newspapers, TV and radio — all of them have commitments to public service. Properly approached and presented, they may be willing to support your plans.

CHAPTER 5

FUNDING AND SERVICE DELIVERY OF AUGMENTATIVE COMMUNICATION DEVICES IN ONTARIO, CANADA: STATUS AND ISSUES

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Hugh MacMillan Medical Centre

INTRODUCTION

In Canada, Health and Education issues are largely addressed on a provincial as opposed to a federal level. The province of Ontario has developed an extremely innovative approach to the issue of the delivery of assistive devices for the disabled in general and to the delivery of devices to assist in augmentative communication specifically. This paper will present the general structure of this system and detail it from the perspective of the front-line service provider in a health care agency.

The perspective being presented is that of the Augmentative Communication Service (ACS) of the Hugh MacMillan Medical Centre (HMMC). HMMC is a provincial pediatric rehabilitation facility whose clinical mission is the provision of rehabilitation services to children and young adults. The centre incorporates a hospital; a school ranging from nursery through secondary levels; and an extensive outpatient facility. The major disability groups seen include cerebral palsy, spina bifida and head injury. ACS is a department within the HMMC whose mandate is the provision of services to individuals whose communication is inadequate to meet their daily needs. Besides service delivery, ACS is committed to the provision of education and the development of research (Augmentative Communication Service Annual Report 1985/86, Hugh MacMillan Medical Centre).

The Ministry of Health in Ontario instituted an Assistive Devices Program (ADP) in 1982. The mandate of ADP is "to assist young people and their families with the significant cost of selected medically necessary devices designed to replace an absent or augment a weakened physical function, prevent deterioration, minimize pain and support, activate and protect parts of the body" (Ontario Ministry of Health, 1982). The program, originally implemented to cover individuals up until their 19th birthday, has recently been expanded to include individuals aged 23 or younger with the promise of universal coverage within two years. At its inception, the program covered devices such as prosthetic devices, wheelchairs and the like. In 1984, it expanded to include augmentative communication devices which are defined as "an assistive device(s) and or system(s) which provides a means to transmit ideas and facilitates communication for persons whose disabilities preclude oral and/or written expressive language" (Ontario Ministry of Health, 1982).

One of the major innovations associated with this program has been the close attention to service delivery as a necessary partner in the provision of devices. Hence a system of clinics and clinic levels is also being developed. The provision of devices coupled with appropriate services to ensure excellent assessment, training and follow-up services is being undertaken on a provincewide basis. Hence, a comprehensive system is being developed and implemented to service a popula-

tion base of approximately 8 million and a geography which stretches some 2,000 miles from north to south and 1,500 miles from east to west.

This paper will highlight the program as currently implemented, plans for further expansion, and current issues and concerns.

MODEL/APPROACH

Device Funding

Currently assistive devices are funded through the Ministry of Health Assistive Devices Program and covers devices found on an "approved" list. Most devices covered through this program are purchased by the individual on a shared basis, with the Ministry of Health paying 75% of the cost and the individual paying the additional 25%. Devices purchased in this fashion are typically considered as the property of the individual. Individuals can only acquire replacement or upgrade equipment following a specified time period -- typically three years.

In the communication aids portion of the program, the list of devices eligible for funding is extensive. It covers devices that are used as augmentatives to both face-to-face and written communication. The device list is constantly revised and expanded following a systematic protocol which examines both technical and clinical efficacy. Devices must be reviewed and recommended using the protocol by at least two authorized clinical/technical teams in order to be added to the approved list. A copy of the list as of December 1986 is found at the end of this chapter.

Devices on the list are classified as being either general augmentative communication devices (e.g., call bells, typewriters) or specialized augmentative communication devices (e.g., speech output devices, standard microcomputers). For the high technology devices found in the specialized portion of the list, an alternate arrangement of funding and supplying devices has been negotiated. This involves the leasing of equipment to clients. The mechanism for equipment lease involves the authorized Augmentative Communication Centre purchasing the necessary equipment and being reimbursed by the government for 100% of the purchase cost. Appropriate equipment is then leased to the client utilizing the following formula: equipment is leased at 2% per month of the purchase cost of the device for prescribed hardware and 1% per month for prescribed software and expendable items such as switches. The total leasing cost is then covered in a split fashion, with the Ministry of Health contributing 75% of the leasing cost and the individual paying the other 25%.

In implementing these leasing arrangements the client or family sign two contracts with the Centre. One is a contract that acknowledges their responsibility for the 25% of the leasing costs (often covered through charitable agencies such as the Easter Seal Society or the March of Dimes); the other is a clinical contract that is individualized to outline the clinical goals as negotiated between the client, family and clinical team, and carries a clause stipulating the contract will be canceled if the equipment is found to be unsuitable by either party or is being misused.

The rationale for leasing as opposed to purchasing in this portion of the program is outlined. Through leasing, equipment made available to the client can be revised at any time without additional major financial expenditure on the part of the client/family. In exchange for the lease fee, the clinic undertakes responsibility for the administration of the program as well as for ongoing maintenance of the equipment. This in part addresses the problem of servicing unique constellations of equipment over a large geographical area. The problem of clients being left without equipment is also addressed, as the clinic will send replacement equipment if the necessity to return equipment for repair arises.

The Ministry of Health system benefits in that equipment no longer useful to one client can by recycled to another, as opposed to being left with the original client. The major benefit is that as new technology emerges or as the needs of the client and his/her environment change, new equipment can be tried in the home environment, the prescribed equipment can be altered without major financial burdens to the client, and the original financial commitment of the family is much reduced as shown in the following chart.

Example of Equipment Lease

Equipment	Purchase Cost	Lease Cost Annual	Ministry of Health Portion Annual	Client Portion Annual
Hardware	$4,000.00	$960.00	$720.00	$240.00
Software	500.00	60.00	45.00	15.00
Totals	$4,500.00			$255.00
Client Portion	$1,125.00 (25%)			

Clinic Funding

Devices approved for prescription can only be prescribed through a small number of authorized clinics. Clinics are designated as being either general or specialized augmentative communication clinics and their prescriptive authorities are linked to this designation. In 1986, operating funds were made available to five of the six specialized clinics to ensure that appropriate clinical and technical teams were available to assess clients, prescribe devices, and implement appropriate intervention strategies. Operating funds per clinic ranged from approximately $60,000 to $525,000 per annum. These operating funds are ongoing.

Plans are currently underway to implement this designation through a joint peer review and Ministry of Health review process. A new system has been developed which will authorize clinics, as well as individual practitioners, at one of four levels. Guidelines are being implemented to add new clinics in the province in a more systematic fashion. The hierarchical nature of the system will allow clients who present as the most difficult to serve to move up the system to more sophisticated clinics. These sophisticated clinics will in turn be responsible for networking with less advanced clinics to ensure transfer of information and the ongoing development of expertise in the field.

The clinic guidelines developed attend to the following areas:

- appropriate interdisciplinary teams dedicated to the field,
- appropriate location of clients to ensure clients provide a sufficient "critical mass" to maintain clinic expertise,
- appropriate levels of education both in terms of professional training and public awareness (linked to a clinical facility),
- ongoing research and development,
- ongoing device evaluation,
- device modification, customization and development

The specifications of the clinic levels/guidelines are found in Appendix B of this chapter.

Strengths and Weaknesses of the Model

The overwhelming strength of the system in Ontario is that it comprehensively attends to the integration of clinic operation in conjunction with device funding. Other comparable systems deal with one or the other. The system supplies necessary equipment to clients without imposing undue financial hardship on the family. This is particularly critical in Canada which has a socialized system of medicine where devices and other medical services are rarely paid for personally. The system benefits both the clinical team and the client with its flexibility with respect to device prescription. It also carries a measure of quality assurance with the peer review process for clinic-level authorization.

The system is costly to administer both provincially and locally. Provincially, the government must process considerable documentation relative to clinic levels, authorized equipment, individual prescriptions and ongoing leasing cost. Locally, clinics must devise a system to deal with large inventories for which they are responsible, most of which are located remote from the facility. The administrative and accounting procedures necessary to implement and maintain leasing and maintenance portions of the program are extremely time consuming. The liberal nature of the program presents the potential for abuse in new pieces of equipment being added to the system or in individual clinics overprescribing. The concept of centre-owned equipment creates the concern that suddenly a large amount of government-funded equipment could become obsolete in the event of major changes in technology.

Issues and Problems

Current obstacles being encountered in Ontario focus on one major problem, that being the lack of appropriately trained personnel across all the involved disciplines in augmentative communication (speech-language pathology, occupational therapy, special education, pediatric medicine and technology development). For the most part, in Ontario the facilities involved in preservice training for these disciplines do not offer any training in augmentative communication. This issue has been challenged through a position paper presented to the Ontario Ministry of Colleges and Universities outlining the problem and proposing several short- and long-term solutions.

A second major problem is the lack of coordination between the Ontario Ministry of Health and the Ontario Ministry of Education. Hence, through the Ministry of Health program, devices are prescribed for home use by the client. It is often necessary, and appropriate, to ensure equivalent equipment is available for use by the client in the school setting. This is particularly critical with the prescription of non-portable writing aids such as microcomputers. As the Ministry of Education does not have a comprehensive device delivery system this must frequently be negotiated by the clinical team on an individual basis dealing with the clients' local school board. This is a time-consuming and difficult process.

A further issue, not unique to Ontario, is the concept of a specialized service such as augmentative communication being of necessity through centres of excellence, usually located in major urban centres and providing a "critical mass" in terms of client load. This must be weighed against the benefits of local community-based services that can work with clients in their home environment. Although the clinic levels being implemented in Ontario address this issue in part, a totally satisfactory solution has still not emerged. Other approaches, including travelling clinics, mobile vans to network with local professionals, and the possibilities of telecommunications, are yet to be explored. This problem is faced throughout North America where large geographical regions are involved.

Recommendations

The model currently being implemented and expanded in Ontario is a comprehensive one addressing many of the problematic issues in the delivery and funding of augmentative communication services and devices. The model certainly seems worthy of evaluation and potential duplication by other funding/service delivery agencies.

REFERENCES

Parnes, P. (1985/1986) Augmentative Communication Service Annual Report, Hugh MacMillan Medical Centre, Toronto, Canada.

Ontario Ministry of Health (1982). Assistive Devices Program, Administration Manual, Toronto, Canada.

APPENDIX A

3.0 ELIGIBLE COMMUNICATION AIDS

INDEX

PP 3.2 Voice Amplifiers
3.2-3.3 Artificial Larynges
3.3 Typewriters
3.3 Tape Recorders
3.4 Signaling Aids (Call Bells)
3.4 Custom Boards and Charts
3.4 Scanners
3.5 Voice Output Devices
3.5 Computers
3.6 Printers
3.6 Voice Synthesizers
3.6-3.7 Keyboards and Keyboard Emulators
3.7 Software
3.7-3.8 Cards
3.7 Miscellaneous

3.1 SPEECH AND VOICE AIDS

3.1.1 Amplifiers

A.R. Mann
C1000 Communicaid
C1001 Hands Free Mic

Cooper Rand
C 1010 Rand Voice Amplifier with standard microphone
C 1020 Rand Voice Amplifier with headset or Starset microphone
C 1030 Voicette Amplifier with standard microphone
C 1040 Voicette Amplifier with headset or Starset microphone

Park Surgical
C 1050 Park-Bart Amplifier with Hand Held Microphone
C 1060 Park-Bart Amplifier with Headset

Radio Shack
C 1070 Pocket Amplifier
C 1080 Microphone
C 1090 Cord

3.1.2 Artificial Larynges

Aurex
C 1100 Nervox set

Cooper-Rand
C 1200 Intra-Oral Artificial Larynges (pulse generator and tone generator)
C 1300 Intra-Oral Artificial Larynges (No Hands Model A, B, and C)

Park Surgical
C 1400 Barts Mk II Vibrator

Siemens
C 1500 Servoc Electronic Speech Aid

3.2 AUGMENTATIVE COMMUNICATION AIDS -- GENERAL

3.2.1 Printed Output Communication

Canon
C 1600 Communicator M

Prentke Romich
C 1700 Expanded Keyboard Memowriter

Portable Typewriters (Carrying cases and adapters are covered. Chargers and battery packs are not covered).
C 2000 Typewriters -- General

3.2.2 Recording Aids

C 2200 Recorders -- General

Tash

C 2300 Microcassette Recorder (Sony M9000) with adaptor

3.2.3 Signaling Aids

Prentke Romich

C 2400 Call Signal 2
C 2500 Call signal 3

Tash
C 2600 Call bell #4500
C 2700 Voicemate with appropriate switches

Zygo
C 2600 Emergency Call Alarm Model 4
C 2900 Yes/No Box

3.2.4 Custom Boards and Charts

C 3000 Level I: 0 to 60 items
C 3100 Level II: 60 to 150 items
C 3200 Level III: 151 to 250 items
C 3300 Level IV: 251 to 400 items
C 3400 Level V: 401+ to items

3.2.5 Switches, Mounting Systems, Keyguards, Standard Mouth Sticks/Pointers

C 3500 Switches, Mounting Systems, Standard Mouth Sticks/Pointers
C 3550 Keyguards

3.3 AUGMENTATIVE COMMUNICATION AIDS -- SPECIALIZED

(Items in parentheses will not be approved as new purchases.)

3.3.1 Scanners

Prentke Romich
C 3600 MS-3 Versascan

(C 6100Autocom)
(C 6110Express III)

Tash
C 3800 Com Board #2600 (Adaptor included)

Zygo
C 3900 Scanner Model 160
C 4000 Scanner Model 100

3.3.2 Voice Output Device

Phonic Ear
C 4200 Vois 130
C 4300 Vois 135
C 4400 Vois 140
C 4500 Vois 150

Tash
C 4600 Vocaid
(C 8100Voicemate #2700)
(C 8110Speak and Spell with expanded Keyboard #2312)

Commetrics or Tash
C 4700 Talking 100
(Texas Instruments C 8200, Speak and Spell)

Shea
C 4800 Special Friend
C 4850 Special Friend Scanning

Prentke Romich
C 4900 Touch talker
C 5000 Minspeak (ordered for the Touch talker or Light talker)
C 5100 Light talker
C 5200 Express (ordered for the Touch talker or Light talker)
C 5300 Memory transfer interface
C 5400 Direct selection sensor (for Light (Talker)
C 5450 Hybrid pointer (for Light Talker)

ACS
C 5500 Epson Speech Pac

Audiobionics
C 5600 Personal Communicator

3.3.3 Computers-Stationary
C 5700 Apple IIe Professional System
C 5750 Apple IIe Starter System
C 6000 Apple IIc

3.3.4 Computers-Portable
C 6200 Epson HX20
C 6300 Radio Shack Model 100
C 6400 Radio Shack Model 200

3.3.5 Computers-Printers
C 6600 Portable dot matrix printers

C 6700 Imagewriter
C 6800 Printer accessories (e.g. tractor feed)

3.3.6 Disk Drives

Apple
C 6900 Unidisc -- 5 1/4"
C 7000 Unidisc -- 3 1/2"

3.3.7 Data Tape Players

Radio Shack
C 7300 Datasette
C 7350 Datasette with loop tapes

3.3.8 Voice Synthesizers

Intex
C 7400 Intex talker

Votrax
C 7500 Votrax Personal Speech System

Street Electronics
C 7600 Echo+

3.3.9 Specialized Switches and Mounting Systems (excluding computer tables)
C 7700 Misc. switches, trays and mounts (to position and activate communication systems appropriately)
C 7900 Mouse
C 8000 Headpointers, chinpointers, mouthsticks

3.3.10 Keyboards and Keyboard Emulators
C 8150 Mod Keyboard (includes MOD cartridge and interconnector box and cable, VIC 20 computer and monitor)

3.3.10 Keyboards and Keyboard Emulators
C 8250 Unicorn keyboard
C 8300 King keyboard
C 8400 Numeric keyboard
C 8500 Mini keyboard
C 8600 Unicorn and adapter for HX20
C 8700 Power Pad
C 8800 Koala Pad
C 8900 Other

3.3.11 Software
C 9000 Talking Blissapple
C 9001 Applewriter
C 9002 Mapwriter
C 9003 Printshop
C 9004 Kidwriter
C 9005 Appleworks
C 9006 Message Maker
C 9007 Bank Street Writer
C 9008 Story Machine
C 9009 Trine for HX20
C 9010 Morse Code

C 9011 Magic Slate
C 9012 Magic Window
C 9013 Schoolwriter
C 9014 Keytalk

3.3.12 Miscellaneous
C 9200 System saver
C 9201 Carrying cases
C 9202 Cables as appropriate
C 9203 Equipment covers
C 9204 Power bars
C 9205 Keylocks
C 9206 Disk guides
C 9207 Keyguards

3.3.13 Cards
C 9300 Adaptive Firmware card
C 9301 Super serial card
C 9302 Grappler card
C 9303 Extended 80 column card
C 9304 Dumpling card
C 9305 Other

APPENDIX B

COMMUNICATION CLINIC GUIDELINES

INDIVIDUAL PRACTITIONER

- Primary/remote locations where therapist is likely to be functioning independently.
- Has day-to-day responsibility for program implementation.
- Facilitator for those who have been referred to another level clinic.
- Prescriptive authority as authorized by ADP.
- Maintain appropriate public records.

LEVEL ONE

- Generalized clinic.
- Be a public agency.
- Has a quality assurance program.
- Has a written agreement with ADP to authorize and prescribe certain devices.
- Minimum of three parties acting as a team. To include speech-language pathologist, occupational therapist and physician.

LEVEL TWO

- Specialized clinic.
- Be a public agency.
- Has a quality assurance program.
- Has written agreement with ADP to authorize and prescribe certain devices (need to think about the devices that could be prescribed at this level).
- Minimum of 2.5 full-time staff equivalent dedicated to the area.
- Has a committee area within the facility.
- Willing to evaluate appropriate referrals.
- Demonstrated team competency in terms of professional qualifications and professional development activities.
- On-site seating service.
- Ready access to technological support.

LEVEL THREE

- Provincewide referral base.
- Be a public agency.

- Has a quality assurance program.
- Agency has written agreement with ADP to authorize and prescribe specialized communication aids.
- Has in-house seating facility.
- Has dedicated staff typically consisting of physician, preferably a physicalist or pediatrician, speech-language pathologist, occupational therapist, rehabilitation engineering specialist-programmer and an educational consultant (some of these staff may have other responsibilities but will have a major emphasis on augmentative communication).
- Has the capability to do long-term sophisticated assessments and prescriptions (e.g., has residential, inpatient, and hotel facilities).
- Has access to appropriate comprehensive health-related services such as psychological counselling, educational consultation and dental services.
- Has the ability to customize and maintain equipment.
- Has sufficient case load to warrant support of the above-mentioned staff.
- Has university affiliation with clinical and teaching responsibilities.
- Is involved with the initiation, development and conduct of research.
- Takes responsibility for program and clinical consultation to other clinics.
- Has a committee clinical area.

SECTION III: ASSISTIVE DEVICE SERVICE DELIVERY

OVERVIEW

The third section, "Adaptive Technology: Assistive Device Service Delivery," provides a descriptive overview of effective and successful service delivery programs currently in operation. The programs presented here are not all-inclusive but are representative of a variety of models and program options. An issue of major concern relative to planning and implementation of assistive device service delivery centers on the question: "Who is responsible for initiating the planning and implementation of services for individuals with communication and mobility handicaps?" This question is imperative since local school districts and state education agencies are seeking the involvement of established resources in an attempt to determine the most effective and efficient way(s) to deliver service.

Most of the issue questions addressed in this section are related to implementation of services, including:

1. Who is ultimately responsible for organizing the delivery system?
2. What are the service delivery model components?
3. What factors were considered in developing a service delivery model?
4. Are mobile units a viable option/component of service delivery?
5. How do you deal with the problem of staff travel?
6. If a model includes a loan center, what prerequisite training/skills are needed to borrow items?
7. What components are addressed in your local implementation policy?
8. How do you train for local implementation of the service model?
9. How does the service delivery model fit into the total curriculum/ educational planning for individuals using adaptive equipment?
10. How can statewide consortia be developed and what impact can they have?
11. What role do informal networks have in service delivery?
12. Are interstate consortia/regional groups of any use in this effort?

It is obvious, however, that the matter of service delivery is based on planning and funding that are integral parts of the implementation process. Therefore, it is up to the reader to establish the relationship between each topic (planning, funding, and service delivery) and extrapolate those components which may be combined to develop a systematic process for identifying and developing a plan to meet state/local service delivery needs. The program descriptions presented here vary in that program philosophy and goals for each are different, and were designed to meet a specific set of needs within their respective states. Although many of the program components, services, etc., will be quite similar, differences may be observed in levels of agency collaboration, program funding sources, service area, and specific services. The chart summarizes similarities and differences in selected programs based on their program philosophy and goals and the set of needs they were designed to meet.

CENTER	FUNDING SOURCE	SERVICE AREA	MODEL TYPE	SERVICE CHARACTERISTICS
Trace Research and Development Center, Madison, WI	Federal Funding, Rehabilitation Center, University Facility	Statewide (Wisconsin); Regional (across states within Great Lakes area)	Center-based	Assessment of client needs; technical assistance; research and development of aids and devices.
Pennsylvania Assistive Device Center, Elizabethtown, PA	State/Federal (PL 94-142)	Statewide	Center-based; Equipment depository	Equipment depository-loan program; technical assistance; training for local augmentative specialists.
Michigan's Living and Learning Resource Centre, Lansing, MI	State/Federal (PL 94-142), State (Michigan Commission for the Blind), non-public matching funds	Statewide	Center-based; Information clearinghouse	Assessment of client needs; short-term equipment loan; professional development training.
Arkansas Easter Seal Society Outreach Program, Little Rock, AR	Private/Nonprofit (Easter Seals), State/Federal (PL 94-142 funding of Outreach Program), collaborative services with State Department of Education	Regionally (within state) and statewide	Outreach center; On-site evaluation	Evaluation of client needs; consultation and training; short-term loan of devices; consultation for acquisition of funds.
Rocky Mountain Regional Center for Augmentative Communication, Boulder Memorial Hospital, Boulder, CO	State (hospital budget); Cooperative service agreement with the Colorado Department of Education	Regionally (within state)	Center-based	On-site evaluation of client needs; consultation for acquisition of funds; inservice training and technical assistance.
Non-Verbal Assessment Program, Los Angeles Unified School District, Los Angeles, CA	State/Federal (Grants: Title IV B), District funds	Local (district wide)	Center-based; Satellite sites	Assessment of client needs; equipment loan; training and follow-up to client and family
Augmentative Communication Services, Minneapolis Public Schools, Minneapolis, MN	State/Federal (PL 94-142)	Local (district wide)	Center-based	Assessment of client needs; facilitation of equipment acquisition, dissemination, and repair; in-service training to parents and professionals; citywide/statewide technical assistance to school districts, consumers, etc.; data collection.
Non-Oral Communication Services, San Francisco, CA	Contractual on a client-by-client basis with local school districts who receive 70% reimbursement from State Department of Education; Individual client fees	Local (San Francisco Bay Area)	Community-based (private)	On-site assessment of client needs; training for school staff and clients; follow-up.

CHAPTER 1

SERVICE DELIVERY AND RELATED ISSUES AT THE TRACE RESEARCH AND DEVELOPMENT CENTER

PRESENTER: Roger O. Smith
Trace R&D Center
University of Wisconsin-Madison

THE TECHNOLOGY ENVIRONMENTAL CONTEXT

To fully understand the service delivery operation of the Trace Research and Development Center, it is necessary to briefly describe the overall environmental context in which the Trace Center fits. It turns out that, in the field of rehabilitation/education technology, there are eight major categories that describe program activities. Four of these are service delivery activities. The other four are not specifically service delivery functions, but are vital to effective service delivery programs.

Evaluation and selection of equipment is one of the key service delivery activities. This is a typical procedure for obtaining equipment in all of our daily lives. If we fail, however, to ascertain our needs correctly and consequently purchase the wrong piece of equipment, it may simply be an inconvenience. If, on the other hand, a child with a disability is given the wrong typewriter, or is set up with an inappropriate communication board, it can result in the profound under-utilization of the child's talents, or extreme overtaxing of the child's abilities. If the equipment is not flexible enough to meet demands, the individual will only be working up to 20% of potential. If, on the other hand, the particular device is designed to function well above the individual's capabilities, the system only aggravates a frustrating experience. We see these situations in our affiliated clinics too often, and the result is usually that the device or system ends up in somebody's closet.

Once a particular device or system has been matched to an individual and his/her particular disabilities, availability of equipment becomes a major service delivery activity. This is where we rely on the distribution activities of any service delivery system. Historically, many rehabilitation and educational technological devices have been invented, developed, and researched in the laboratory, then only presented in some esoteric technology conference. Thus, they are never marketed and never become available to those who need them. Distribution systems are vital to adequate service delivery.

Assuming that the particular device or system is adequately distributed, implementation or using the device or system is the next critical service delivery activity. Successful implementation of any technology relies on adequate training. Any device is totally worthless without the user being able to apply it within functional situations. Thus, the ultimate training needs to be provided directly to the user of the device or system. In most rehabilitation and educational settings, however, this also requires training of the service delivery professionals, to be trainers. A service delivery system without this dual training activity will likely be ineffective.

Assuming that the service delivery program evaluates individuals well, selects the appropriate pieces of equipment, assures that the equipment is distributed, and provides a system for training

the professionals and users, one major activity is still required to prevent a service delivery system from degenerating into a useless program.

This last activity is the reevaluation, monitoring, and revision of any system or device. At the Trace R&D Center, we know of no communication aids or systems that are self-perpetuating. Every one of the pieces of equipment or communication systems that we have recommended or placed has required ongoing reevaluation because the child is growing or the adult is improving in skills. Furthermore, periodic reevaluation is not adequate. Ongoing monitoring of the system is necessary because reevaluations frequently take place in less than optimal environmental situations, such as a child in a testing environment and not the natural communication setting.

When the four service delivery activities, described above, are all integrated, they can result in an effective program. In the "macro" service delivery picture, however, their real success is dependent on four other affiliated service delivery activities. First, any technological equipment is dependent on whether that equipment has been manufactured. Either a one-time fabricator is necessary, or a mass market manufacturer must be involved in providing the equipment. Likewise, manufacturing is dependent on a more fundamental activity: research and development. This is the second affiliated service delivery activity. Prior to the manufacture of any system, that system must be developed and tested. Third, service delivery is also dependent on activities which include education, information, resources, and referral. All devices and systems rely on professionals, parents and individual users being aware of their availability, and on resource professionals who can help them select the specifications of the equipment and learn the skills for using the equipment to tackle their particular needs. The last affiliated service delivery activity is the foundation. Service delivery is dependent on basic research. The theoretical and knowledge base of the field provides the substantiation of the methodologies we use within service delivery.

It can be seen that, in the short term, however, service delivery programs must realize their dependence on manufacturers, distributors, developers, researchers and educators. Understanding this context of the technology environment describes the rationale for the Trace Center programs.

SERVICE DELIVERY ISSUES

Four primary service delivery issues can be categorized:

Issue 1: Field Coordination Needs

The first issue relates to the previously described four service delivery activities, and the four related functions. The issue emerges from the critical reliance service delivery has on the four related activities. Any successful service delivery program must interact and coordinate with the other functions to be an effective long-term program.

A key coordination issue that program administrators frequently forget is the imperative nature of continuing education. In the area of rehabilitation/education technology application, the field is changing rapidly, and without ongoing education, a service delivery program will very quickly be using outdated approaches, devices and systems.

Second, the administrative commitment to providing feedback to the research and development centers is critical. The R&D centers are dependent on those who are applying the technology for ongoing suggestions regarding the overall directions of research and development, specific modifications, adaptations, and other R&D needs.

A third area of coordination needed is for administrators of service delivery programs to be providing information to distributors and manufacturers regarding their ongoing and future needs for systems and devices. Distributors and equipment manufacturers are constantly attempting to remain current on the needs within the field, and predicting what the future needs will be. Providing information to these groups of distributors and manufacturers is not only welcome, but necessary.

The fourth area of coordination is in providing feedback to resource centers, schools of higher education, and continuing education programs. These groups of information providers are always forecasting what the most important areas of continuing education needs will be for the professionals in the area of rehabilitation/educational technology. One of the best methods of learning about current educational needs is when the professionals applying the technology specifically request that further education opportunities be available to them on particular topics.

Issue 2: Program Components
(Seven Necessary Components for Matching the System to the Individual)

Matching the device or system to an individual's particular needs to support education goals is a complex process, and one to which much discussion is being oriented within other areas of this conference. A brief listing of the seven procedures is worth mentioning in this context, however. Frequently, however, inadequacies of service delivery programs can be directly attributed to the program's lack of attention to one of these seven procedures.

1. Understanding the potential of technological and nontechnological systems is absolutely critical, before any application can even be considered.
2. The individual must be evaluated to ascertain his/her abilities and functional areas of deficit. This evaluation must look at specific functional activities, look at particular skills and abilities, and also explore the particular reasons that an individual has deficits in certain activity areas.
3. An evaluation must be performed on available systems and technologies. Even though we may have identified the exact problems of an individual, if we are not knowledgeable about available systems and the technological possibilities, we will not be able to make the appropriate match.
4. Once we have fully evaluated the individual and the available systems and technology, a decision must be made to select the appropriate system.
5. Acquiring the system becomes the next step. This is the step that we are already very familiar with, that seems as if it would be simple because the needs are clear. However, actually convincing any funding agency or administrator of the bureaucracy becomes a major skill in itself.
6. Once a system has arrived, the individual who will be using the system must be trained in the appropriate techniques for properly applying the system in his/her own environment.
7. Follow-up and revision of the program on an ongoing basis is imperative.

These seven procedures can be viewed as part of a program checklist. A successful program will perform all seven components effectively.

Issue 3: Vertical Integration of Services

Perhaps one of the most difficult service delivery activities is in the domain of integrating services. Rehabilitation and education technologies have caused the emergence of many specialized professionals. These individuals have, to date, been serving as regional experts. This has restricted the availability of technological services substantially; perhaps the most limiting aspect of this phenomenon has been that individuals usually work for one agency or organization. Thus, when students or clients move into a system that has a technology expert, they have access to these benefits, but when they move out of the system, they quickly lose the benefits of the technology expert.

In medical care, there is a concept called "vertical integration." Acute care hospitals are now vertically integrating their services by expanding their activities to include home health care companies, nursing homes, outpatient rehabilitation services, and even family physician services. The result of these vertically integrated systems is that an individual once moving into the system can receive the full range of benefits and move easily between the various levels of services without falling through the cracks between agencies, bureaucracies, or service programs inherently limited in scope.

The implications of the vertical integration of acute care medical services on rehabilitation and educational technologies is that our systems may need to be thinking more vertically in orientation.

The integration of services will need to occur on two levels. One is across geographical regions, and the second is across the longevity of individuals as they grow and mature. If we look at most existing technology services, we see how they tend to split up into little pieces. In terms of geography, due to the current limited expertise in the field, regional evaluation centers have been virtually the only way many areas can access technology applications experts.

In regard to age groups and maturation levels, the educational system has been providing the best continuity, particularly with the new emphasis across the country on providing appropriate educational opportunities for pre-school-aged disadvantaged children. In spite of these improvements, however, once individuals reach a certain age, they are moved out of the educational system, too often into nowhere. This "transitional dump" is the example of our need to vertically integrate services across years. There needs to be a method for transferring technologically oriented services from the educational arena into the vocational domain. Some have suggested that the best method for doing this is to encourage the medical system to provide the continuity and take responsibility for technological services. In any case, the vertical integration of services across regions and years is going to demand substantial attention by the educational, vocational, and medical systems within the next few years to improve any of our current service delivery methods in a comprehensive way.

Issue 4: Competency of Professionals

There is a trend to be looking at service delivery professionals and programs that apply technology more carefully. It has been suggested that appropriate application of technology in rehabilitation and education requires a high level of expertise in several ways. First, any service delivery program should be assessed in terms of how well it provides the coordination for the field in the four areas listed previously. Second, a program should be evaluated in terms of how well it provides the procedures necessary for competent application of any technology-oriented service delivery in the seven steps described earlier. Third, competency should be evaluated across functional areas of need. For example, competency across functional areas in the service delivery

context of augmentative communication highlights five functions. Expertise needs to be available in 1) seating and positioning, 2) motor and sensory areas (physical interface to any system), 3) cognitive and language areas, 4) social and environmental communication areas, and 5) acquisition of funds and equipment. These sets of program competency questions can be compiled into a program evaluation checklist. An example of a checklist summarizing the points discussed in this paper is shown in Table 1 on the following page.

These service delivery competency issues emphasize the need for some type of quality assurance. Methods of qualifying service delivery programs are beginning to be discussed within the rehabilitation/educational technology associations and professional groups. Guaranteeing competency through certification, licensure, or accreditation is being identified more frequently as a need within this field. Until this occurs, however, we have few external guidelines to help us in knowing and expressing competency in the field.

THE TRACE CENTER'S FUNCTIONS AND SERVICES

The Trace Center currently serves four major areas of function and services in the area of rehabilitation/education technology. The first is research. As one of the nationally funded Rehabilitation Engineering Centers, the Trace Center has a mandate to perform research in the field of communication, control, and access to information technologies. Consequently, its research thrust has provided vital information to the field with regard to the human use of communication devices and systems, and the effectiveness of using certain techniques and approaches with various disabilities. The research at the Trace Center has led to and has been integrally tied to the following additional functions.

The second major thrust of the Trace Center is in the area of developing new products, concepts, and information. Over the last decade, the Trace Center has developed numerous new devices and ideas that have been adopted by manufacturers of communication systems internationally.

The third primary function of the Trace Center is its information resource and referral services. The Trace Center disseminates information via the production of resource books, through its reprint service and through its workshop series. All of these methods have been providing current information to the field in the area of communication, control, and computer access. Additionally, and perhaps most significantly, the information resource and referral services provide the Trace Center staff with information. They, in turn, maintain their current knowledge of the products, applications, and communication approaches being used throughout the country and the world.

The fourth major function of the Trace Research and Development Center is to support service delivery programs. There are four programs with which the Trace Center is involved. Sara Brandenburg from the Trace Center has provided more in-depth information about two of these service delivery programs, focusing on the evaluation process. Thus, only an overview of the four programs is given here.

The first service delivery affiliated program is the Communication Aids and Systems Clinic (CASC). CASC is administrated through the Clinical Sciences Center at the University of Wisconsin-Madison; the Trace Center shares staff with CASC. The population which the clinic serves is best described as all populations; approximately 50% are school age, and 50% non-school aged. Its overall emphasis of evaluation and treatment is on communication systems and access to the most effective system for the specific individual. The program process used by the CASC is primarily an outpatient evaluation, with some inpatient hospital involvement. The over

TABLE 1

PROGRAM EVALUATION CHECKLIST

A. Field Coordination

1. Does the program provide adequate preservice education for the professionals involved in applying the technically oriented devices and systems?
2. Does the program provide sufficient ongoing continuing education so that all team members within the program may maintain their skills?
3. Does the program have a mechanism for providing feedback to relevant research and development centers?
4. Does the program have a method for providing feedback to manufacturers and distributors of equipment in the area?
5. Does the program have a feedback mechanism to provide information to institutions of higher education and resource centers that can facilitate appropriate continuing education programs?

B. Program Components

1. Do program staff members understand the full potentials and limitations of the technology they are applying?
2. Does the program provide a comprehensive evaluation of the individual student/clients in critical areas of functioning?
   a. seating and positioning,
   b. motor-sensory function (physical interface),
   c. cognitive and language functions, and
   d. social and interactive functions.
3. Does the program provide adequate evaluation of the different technological devices and systems?
4. Does the program match the needs of the individual to the capabilities and features of the technological systems?
5. Does the program secure the needed funds and assist in the acquisition of the equipment or devices required?
6. Does the program provide appropriate training for the users to be able to apply their systems in all of their needed environments?
7. Does the program incorporate appropriate follow-up in terms of monitoring the existing system and revising/updating the system as needed?

C. Vertical Integration

1. Does the program integrate across geographical regions?
2. Does the program integrate across the longevity of the students/clients within the program?

D. Competency of Professionals

1. Do the program team members have appropriate experiential and educational backgrounds?
2. Do the program team members hold appropriate licensure/certification/registration credentials for providing the needed services?

all format of the CASC contains several unique features. One is that an information form and videotape are required prior to a clinic evaluation. Thus, all potential clients or students first receive an initial background and history form to complete. Later, they complete a more detailed information form about their communication, seating and positioning systems. At this time, they submit an actual videotape of the client's/student's performance in the school or home setting. A second component of the evaluation process is that the team, which consists of speech and language pathologists, occupational therapists, and rehabilitation engineers, reviews the history and information form, along with the videotape. During this pre-evaluation conference, an evaluation strategy is proposed which provides the framework for the actual evaluation procedures when the client arrives. The third component of the process is the actual evaluation. As many members of the client's/student's educational/rehabilitation team as possible, if not the entire team, are requested to attend the evaluation. CASC feels that it is critical for the client's educators, clinicians, and family members to be involved with the client during the evaluation process.

The actual procedures during the evaluation begin with an introductory discussion with the student/client and entire support network. These groups range from as few as 2 people, or as many as 8 or 10. During this session, initial goals are identified, and an evaluation strategy finalized. Then, the client's/student's positioning and seating is evaluated, which results in recommendations and possible modifications. The next step in the procedure is the communication evaluation, where the student's/client's interaction skills are assessed, along with language and speech skills, and overall cognitive abilities. The final step of the evaluation procedure is the assessment of the student's/client's physical interface. This usually includes simulation or actual demonstration of various communication aids and systems. This process begins with evaluating the student's/client's current system and proceeds on a trial basis to interface with modifications to the current system or introduction of a new system(s).

Following the evaluation, the fourth major component of the overall CASC program process occurs. This component is the follow-up with funding of any equipment that may need to be purchased, the actual purchase or loan, the introduction of any communication program that has been recommended, and the training of the overall communication system.

The Communication Development Program (CDP) is the second service delivery program affiliated with the Trace Center. The CDP is administrated directly through the Trace Center and funded by Dane County. The population served by this program consists of non-school age clients with developmental disabilities. The program process relies on a diverse set of activities. A large portion of the time is spent coordinating existing therapy and support systems within every client's environment. This requires a significant amount of consultation. Additionally, direct therapy is provided for a substantial number of the clients. In virtually every case, advocacy for the client becomes a primary role for the program staff. The program is staffed by speech and language pathologists who provide the direct services and the coordinating services. The CDP program activities are provided much differently than the evaluation process of the CASC. With the CDP, the services are provided basically on-site within the client's environment. This means that the clinicians within the CDP spend most of their time in client's homes, on work sites, and out in the community.

The third service delivery program affiliated with the Trace Center is the Rehabilitation Research Services (RRS). This program is administrated through the Trace Center, and funded through cost-reimbursement. The services provided by the RRS are basically technological equipment adaptation, construction, and one-time project development. The clients of the RRS are from the Trace Center affiliated clinics.

The fourth service delivery program includes limited-term projects, usually with outside grant funding. An example of this type of project is the DATA project (Disabled Access to Technical Advances). The Trace Center's involvement in this project was subcontracted as part of a larger grant involving the Vocational Rehabilitation Department, Computers to Help People, and Access to Independent Living, Inc. (the Madison region independent living center). This project was aimed specifically at providing technological systems to clients with the primary objective of moving them into successful employment. Research data were collected to demonstrate the effectiveness of technological intervention in securing and maintaining long-term employment for persons with disabilities.

CONFRONTATION OF SERVICE DELIVERY ISSUES

The Trace Center attempts to confront many of the service delivery issues head on. Both the CASC and the CDP attempt to address the four coordination needs. These programs strongly support continuing education to maintain the expertise of all of the treatment staff. These programs also provide direct feedback to the research and development programs and staff of the Trace Center, and to other research and development centers throughout the country. Due to the nature of the research and development at the Trace Center, all of our clinically affiliated staff have easy access to distributors and manufacturers in the field. Consequently, the treatment staff provide ongoing information to distributors and manufacturers regarding the availability, or lack of availability, of systems and devices. With regard to providing information on educational needs back to resource centers and schools of higher education, the service delivery staff at the Trace Center are very involved in their respective national associations and their continuing education programs. Furthermore, many of the Trace Center staff have joint appointments with related professional educational programs at the University of Wisconsin. Perhaps most profoundly, the service delivery staff can directly feed information to the workshop series run by the Trace Center.

Both the CASC and the CDP work very carefully on the seven necessary steps in matching functional systems to individuals' needs. Each one of the programs, however, has its own particular advantages and disadvantages. For example, the CASC provides full evaluations; however, due to its regionally oriented format, the training and follow-up aspects become very difficult. On the other hand, the CDP is primarily a coordinating program, so it is able to do an extremely competent job in training in follow-up, but it does not have the same full access to the concentrated, interdisciplinary team evaluation.

Perhaps one of the major challenges of all of the service delivery programs affiliated with the Trace Center is vertically integrating services across geography and across the developmental years and maturation years of its clients/students. The CDP, however, does do particularly well in addressing the need for integrating services across the years, because it specifically provides services for those excluded from the educational services because they are not of school age.

IMPLICATIONS/RECOMMENDATIONS/SUGGESTIONS FOR SERVICE DELIVERY

There are two major implications revolving around what we have seen at the Trace Center in terms of service delivery. First is that the concept of comprehensive community service delivery centers in rehabilitation/education technology is becoming mandatory. The formulation of these types of delivery centers would, of course, need to be very carefully and directly linked to the specialized regional centers. For example, the ideal scenario might be that specialized regional centers would focus on areas such as wheelchairs, positioning and seating, computer use and access, augmentative communication, or motor and sensory access techniques. These specialized re-

gional centers would then serve as the intense evaluation and resource centers which all of the community centers would tap. To supplement a maintained compilation of the most advanced of human factors and therapeutic techniques and approaches, the specialized regional centers would also house the most complete and most current technological devices and systems.

The second major implication for service delivery is that, regardless of what type of service delivery program is being provided in rehabilitation/education technology, there seem to be significant funding barriers. Consequently, there needs to be an increased awareness of what the potentials are in the applications of these types of technologies. Then funds must become available to provide direct contact services. Even more important is the need for legislators, administrators, and other power brokers managing important technological funds to recognize that service delivery in the area of technology and education rehabilitation involves a substantial amount of time for coordination, management, administration, team meetings, and continuing education. Thus time cannot be funded just for direct student/client contact. Significant time must be available for these other functions. One of the very important needs we have been able to provide through the CDP has been due to its funding base. The county funding has permitted the staff of the CDP to serve as client advocates and coordinators for the clients' overall communication program within their entire work, home, and community environments. We have found that it is only under these reimbursement or funding scenarios that the vertical integration and overall coordination of service delivery can be obtained.

CHAPTER 2

IMPLEMENTING A SERVICE DELIVERY PROGRAM: EXPERIENCES IN PENNSYLVANIA

PRESENTER: Mary Brady -- Coordinator
Pennsylvania Assistive Device Center
Elizabethtown Children's Hospital and
Rehabilitation Center

INTRODUCTION

This conference was organized around the topics of planning, funding, student assessment and service delivery. The other three components of providing a state-wide system for utilization of assistive devices describe "what" (planning), "to what degree" (funding) and "for whom" (student assessment) the services and products are made available. The aspect of this process detailed in the following paper describes the "how"; the human systems, the pragmatic and logistic concerns that have been and continue to be necessary to consider in conducting one such program. Before any such discussion can be meaningful, however, we must be sure to approach the topic with a clear understanding of the realm being addressed.

DEFINITION OF TERMS

In the special education technology universe inhabited by teachers, therapists, rehabilitation engineers, computer experts, administrators, parents and students even the term "assistive devices" is open to debate. It was recently defined in the Encyclopedia of Special Education:

> The term assistive device has been applied to a wide range of highly specialized mechanical, electronic, and computer-based tools which are now commonly used in rehabilitation and special education settings. The assistive device is typically designed to perform a particular prosthetic or orthotic function, but it is not a prosthesis nor an orthosis in the traditional medical sense. (Reynolds & Mann, 1987)

This functional definition goes on to include sensory aids, communication aids, computer access devices, and aids to daily living. Writing aids and special-function or adapted learning tools such as a specially mounted commercial device, for example, a calculator (Figure 1) or cassette tape recorder with sliding control to ease operation (Figure 2) are also considered assistive or adaptive devices. The term "assistive devices" is preferable, because it relates to the function of the article, rather than to its derivation. Such devices may in fact be commercially available special function items, adapted from mass market items, or a combination of both (Rodgers, 1984). Most assistive device systems contain components of each, such as the typical Apple computer set-up, with an adapted keyboard, and a customized switch or headpointer.

Educators are not the only professionals currently struggling to define this realm. The Institute on Rehabilitation Issues, a consortium of vocational rehabilitation experts, provides this guidance:

Figure 1: A specially-mounted commercial aid (Casio)

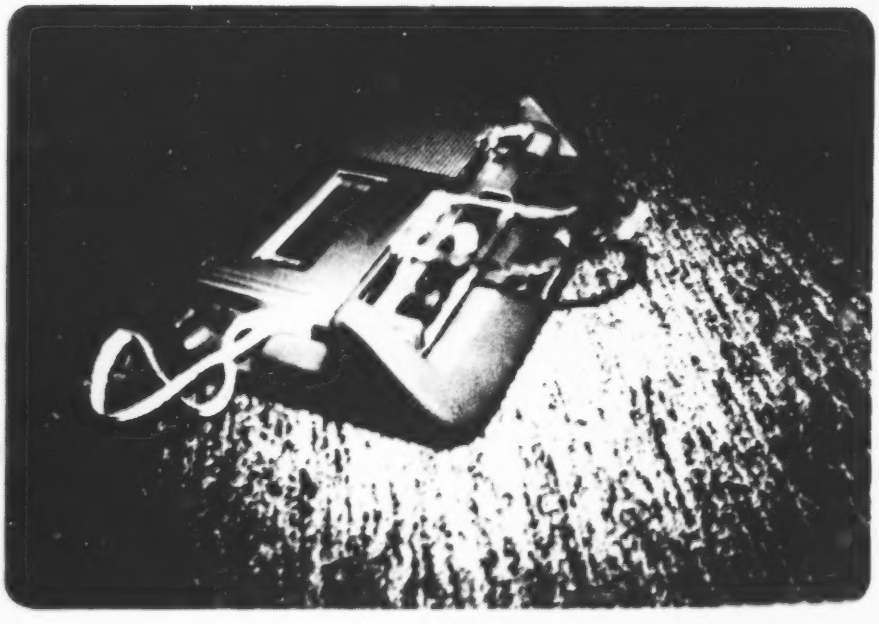

Figure 2: Cassette tape recorder aid from TASII

> Rehabilitation technology includes compensatory strategies and adaptive equipment to increase or improve the functional capabilities of persons with disabilities. It is used to enhance the vocational, educational, and/or independent living opportunities for persons with disabilities. It may be further defined as technological methods of achieving practical purposes in the rehabilitation process. Devices, equipment, and strategies used in this process may be individually created or may be adapted from available equipment or strategies. (Thirteenth Institute on Rehabilitation Issues, 1986)

Note tha[illegible]e IRI definition of "rehabilitation technology" is slightly broader than the Encyclopedia of S[illegible]cial Education's definition of "assistive devices." This reflects the appropriate life-spectrum concerns of the two areas: learning tools for students, and vocational/independent living devices for vocational rehabilitation clients. Included in the IRI definition are biomedical technologies, wheelchairs, adapted vehicles and architectural modifications, as well as nonhardware-intensive strategies, such as job sharing.

Apart from vocational rehabilitation, service delivery in the area of assistive technology has also been provided by speech and language clinics and medical facilities, in research and development settings, by volunteer organizations such as the Telephone Pioneers of America, and by durable medical equipment (DME) dealers. Although this is a new area to special education, these other types of service providers have been involved in the area, albeit without a coordinated or comprehensive approach, and with spotty results, for many years (Office of Technology Assessment, 1982).

The various components of service delivery include clinical, training and equipment provision aspects. Clinical services are assessment and evaluation (what's there in terms of student needs, capabilities, and technology available to meet those needs, and how well is it all working together?) and therapy (formal goal-oriented practice with the device). The training areas are training the end-user (student), training caregivers (teachers and therapists), and training parents and significant others (aides, attendants, siblings). The major concerns with regard to equipment are the 1) allocation of resources, and 2) the logistics of distribution.

OVERVIEW OF SERVICE DELIVERY ISSUES

With regard to providing communication aids, environmental controls, and computer access systems to end consumers, there have been two seemingly insurmountable problems confounding the effort: funding of high cost device systems, and provision of ongoing student evaluation, training and follow-up therapies. In the past, locating a device that could provide the needed functions was also somewhat challenging: that at least has changed considerably with the current flock of multifunctional devices which can be accessed using a number of input techniques, and which in turn provide a wide number of output options.

The reasons given for the funding problem range from the relatively high cost of systems ($2000 - $12,000) to the unproven, or at least inadequately documented, efficacy of these tools as vocationally or educationally sound and necessary expenditures. Lack of professional expertise and available services for describing, locating or designing the devices, training their users, and providing the therapies (occupational, physical and speech-language) needed to use is well known. The widespread availability of this technology is so recent that colleges are only beginning to offer comprehensive professional or pre-professional training programs for these disciplines using state-of-the-art technologies. As is traditional with service professions, insufficient resources have been applied to achieve results in keeping with current knowledge. Unlike engineering or medicine, speech therapy and special education classes at the graduate and undergraduate levels

have not kept pace with current technology practice. At present, only a handful of college programs training speech therapists offer even one course in augmentative communication. Instead, such efforts have evolved outside the traditional training grounds, through in-services, manufacturers' workshops, conferences and continuing education offerings. Consequently, expertise is still diffuse, and its development is not yet well supported.

The approach taken by the Pennsylvania Special Education Assistive Device Center addresses these problems in a new way -- by achieving a critical mass of technology availability and awareness in a segment of the target consumer population. With adequate equipment, technical support and opportunities to participate in training activities, a strong local network of expertise naturally forms. Using this approach, economies of scale and a cost-effective, ongoing service delivery system are being built for the school-aged and school-aged subset of the total client population which could benefit from the judicious application of these technologies. The program is in its third year of operation. Feedback from the intended service consumers (teachers, therapists, students) and from professional colleagues has been strongly supportive of the approach. Results are being continuously monitored through daily contact with local specialists and administrators, as well as more formal advisory processes and user surveys.

A DESCRIPTION OF THE PENNSYLVANIA SERVICE DELIVERY SYSTEM

The Pennsylvania Special Education Assistive Device Center (PA-ADC) was conceived to provide appropriate and necessary technology to preschool and school-aged handicapped children in the state of Pennsylvania. In fact, the project has focused more heavily on communication, writing and computer access aids than on sensory, environmental control, mobility or independent living aids. This decision was made because the population in need of communication, writing and computer access devices was seen to be the most underserved in past programs in the state at the time of this program's inception. In other words, we targeted the multiply physically handicapped students for whom little programmatic or technology expertise had existed to enhance educational opportunities in the past. Mobility needs were not addressed, per se, because of the cost involved and the vast population needing such services; the responsibility of the local education agencies (LEAs) and their existing relationships with private and public medical service providers was to take precedence with regard to wheelchairs, walkers, standing devices and transportation issues. Communication, computer access, and writing aids can be appropriately addressed through a statewide education agency program. It is true that a child who is inadequately positioned cannot hope to operate an assistive device effectively; for this reason the PA-ADC has employed a seating and positioning specialist, and does address the area of device positioning, designing custom trays and switch mountings, and drawing attention to certain occupational therapy principles.

Fortunately, commercially available aids have improved steadily over the past several years and now offer more reliable service and variety of applications. Commercially available seating systems which are modular and appropriate for our students are now much more widely in use.

The program is administered by the Central Pennsylvania Special Education Regional Resource Center (SERRC). SERRC has an ongoing educational service delivery network of some 20 years duration. It manages a large lending library of professional materials (including software), conducts workshops and inservice training on-site throughout the state, and most recently has been providing specific technical expertise and centralized laboratory-style training in educational computer applications. There are 16 professional positions associated with operation of the Central SERRC. Two other Regional Resource Centers in the eastern and western parts of the state operate similar programs. All Resource Centers are funded by the Pennsylvania De-

partment of Education, Bureau of Special Education. The PA-ADC program under discussion here is a statewide program; however, it was initiated and is administered by the Central SERRC.

The Central SERRC is located in Harrisburg, the state capital. The ADC is headquartered in the Elizabethtown Rehabilitation Hospital, a historically pediatric rehabilitation center 15 miles away. Staff at the ADC consists of the following five professional roles and backgrounds, with two support (clerical, secretarial) positions: coordinator (M.S. -- Educational Technology), augmentative communication specialist (CCC-speech), positioning and seating specialist (OTR/L), assistive device specialist (M.S. -- Instructional Technology) and rehabilitation engineer (M.A. -- Rehabilitation Engineering).

For the past five years, the Bureau of Special Education has operated a "Minigrant" program through the SERRCs. The Minigrant program is designed to distribute technology to special education classrooms using PL 94-142 funding. That is to say, such federal funding as is allocated and distributed based on the numbers of handicapped children served in a given geographical/locally administered area. In Pennsylvania the Minigrant and ADC programs are both funded through PL 94-142. Teachers and therapists compete by writing small grant proposals delineating their needs and plans for specific equipment. The grants are then processed through the appropriate SERRC for funding. During each of the past five years, $800,000.00 worth of high technology hardware and software, including classroom computers and sensory aids, were distributed by this program. Out of this successfully operating program in the state was created the cornerstone of the PA-ADC's Program Plan -- its Long-Term Equipment Loan Program.

The PA-ADC was originally structured (in 1984) to support three full-time staff people serving as in-service trainers and technical advisors for therapists and teachers needing access to such expertise statewide. As educators were surveyed over time, their interest in, and need for, expanded services in this area became apparent. A statewide "Awareness" conference in the fall of 1985 attracted the attendance of over 300 administrators and classroom personnel. The equipment requirements and the necessity of ongoing training in student needs identification, equipment function and application was readily apparent. Consequently, the Department of Education, Bureau of Special Education responded positively to the program plan presented in 1985-86, allocating $500,000 to fund an assistive device loan program and also providing sufficient resources to add two professional staff to implement such a program.

The most frequently asked questions about this program include insurance concerns, equipment transition (from school to work or independent living settings), and concerns about adequate student assessment and follow-up services. One unifying philosophical strand dictates the way that these concerns are addressed in the program. Cooperative relationships among agencies and students are both required and supported by the ADC program. Ultimate responsibility for the success/usefulness of any technological aid system must rest with the end consumer.

Along the way to achieving that goal of ultimate control over individual independence, local agents come heavily into play. Over the course of the student's school career, those individual professionals involved with the student change, and even the student's educational or home setting, inevitably undergo change. Thus, no one professional or one agency or one program can assume continuous responsibility for services, cooperation or coordination of efforts. Consequently, the ADC loan program focuses on the individual student as the consistent, unifying agent for his/her own services. Devices are loaned, not to classrooms or to therapists, but to individual students for the duration of their need for that system, or until severance from special education services. Currently, options for funding the transition of functional equipment from school to work or independent living settings are being explored with other state and private agencies. Some creative and uniquely cost effective strategies have been suggested.

Local educational agencies are required by the ADC loan program to insure equipment, and to guarantee its availability to the student at all times, including at-home use and use during vacation periods. LEAs are also encouraged to make personnel available for training offered by the ADC. These local efforts are supported by a network of Local Augmentative Specialists (approximately 90 throughout the state) appointed locally by the Directors of Special Education. In an effort to decentralize equipment knowledge, assessment techniques and therapy ideas, the ADC provides tools and ongoing training regionally for these specialists. Since turnover is relatively high among school personnel, such ongoing training is required and will continue to be a major need even as expertise is developed by individuals. It is a tenet of this program that effective follow-through services, although instigated and supported by the state agency (acting through the ADC program) must be maintained by the local personnel directly involved with the student on a daily basis. This approach reduces the previous emphasis on the prescriptive phase of device application, placing such emphasis instead on the follow-through phase.

IMPLICATIONS

Methods of gauging the effectiveness of this program are being devised. A recent ADC-sponsored symposium (March 1987) brought together academically affiliated professionals from Pennsylvania and nearby states to examine research issues which could be addressed, given access to the client population of the project. Among the wide-ranging issues identified were concerns with device usage, communicative competency training of users, and the appropriateness of cognitive demands placed on system users. While an important part of the overall effort is to examine and improve the service offered, we practitioners must seek to involve the research community in taking an unbiased measure of the actual effectiveness of these systems and strategies, once applied. Anecdotal reports and case studies need to be joined by longitudinal research with larger subject pools. Through this program, we can offer researchers access to such a group of potential subjects.

From other existing programs, alternate models of service delivery can offer exciting options, from which we hope to learn much as we proceed.

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CHAPTER 3

MICHIGAN'S LIVING AND LEARNING RESOURCE CENTRE

PRESENTER: Donna Heiner, Ed.S.
Director

INTRODUCTION

The Living and Learning Resource Centre (LLRC) provides a comprehensive information and demonstration center for the selection, development, and/or adaptation of special need high-technology for educational and vocational purposes throughout the state of Michigan.

The unique focus of the LLRC is low-incidence populations, such as individuals with physical or multiple impairments. The LLRC offers individuals or agencies the opportunity of obtaining information on or previewing adaptive equipment and software.

The LLRC complements the PAM Assistance Centre, a sister project which serves the same population on a statewide basis, and which focuses on "light-tech" adaptive aids and devices for recreational, vocational, educational, or daily living activities.

Because the LLRC was established to serve clients from multiple human service agencies, an Agency Oversight Committee (AOC) establishes goals and objectives for the LLRC, acts in an advisory capacity, functions as a liaison to funding and user agencies, and assures that the purposes of the LLRC are maintained and implemented. The AOC consists of representatives from the following:

- Michigan Rehabilitation Services,
- Michigan Department of Education,
- Vocational Education Services,
- Michigan Department of Education,
- Michigan School for the Blind,
- Michigan Department of Education,
- Special Education Services,
- Michigan Department of Education,
- Michigan Commission for the Blind, and
- Michigan Department of Labor.

LLRC PROGRAM GOALS

The overall goal of the LLRC is to provide disabled persons of all ages, and their service providers, with information and technical assistance regarding the selection, handling, and use of adaptive equipment for increased mobility, improved communication, and enhanced interaction with the environment. Five major objectives relate to the preceding overall goal:

1. to evaluate equipment for the handicapped;
2. to identify modifications of tools and/or the work environment for individuals with handicaps;
3. to serve as an information clearinghouse;
4. to provide professional development training; and
5. to conduct diagnostic assessments.

LLRC Program Resources

The LLRC is a State Initiated Project, receiving a portion of discretionary funds derived in part from the Education for all Handicapped Children Act (PL 94-142) and approved by the Michigan State Board of Education. In addition, a Facilities Grant from the Michigan Commission for the Blind (MCB) has made possible a wide assortment of equipment and activities specifically designed for individuals with visual impairments. This second funding source depends on a 20% match from non-public funds. Professional staff currently funded by these sources include the following: Director (.80), Occupational Therapist (.40), and an Instructor/Technician funded through the MCB Grant (.40).

Located in the Library of the Michigan School for the Blind in Lansing, the LLRC houses a variety of computers, adaptive accessories, communication devices, and resources. This site provides a number of significant advantages to the operation of the LLRC. Centrally situated in Michigan's capital, the LLRC is wheelchair accessible and on the bus lines. Classrooms for small and large group instruction are available. A major university, with associated facilities, State Department of Education offices, the central office for the Michigan Commission for the Blind, and an existing population of handicapped students and adults are nearby.

Considerations in Establishing Priorities for Service Delivery

To maximize use of funding and personnel, priorities for service delivery are based on the existing status of provisions for high-technology service resources in Michigan. Michigan's Special Education Technology Plan, the distribution of the special educational population in Michigan, existing state resources for special education technology, and funding patterns for the purchase of adaptive technology helped determine how the LLRC would organize to achieve its goals.

MICHIGAN'S SPECIAL EDUCATION TECHNOLOGY PLAN

Michigan's Special Education Technology Plan, a three-year plan covering the period from 1985-1988, identifies the steps needed to ensure full utilization of technology in Michigan special education. The goal of this plan is:

> To apply technology to the handicapped population such that significant barriers to learning can be reduced and the disability minimized. Through this effort, handicapped students should have more meaningful interactions with society as well as other individuals (Special Education Technology Plan, p.I).

An enabling objective relating to this goal formed the basis for the foundation of the Living and Learning Resource Centre, the mechanism for linking handicapped students with appropriate adaptive equipment and technical assistance.

The Special Education Population in Michigan

On December 1 of each year, the Department of Education takes an unduplicated count of handicapped students by primary disability. Because of the distribution of population in Michigan, the five special education regions of the Department of Education vary greatly in numbers of handicapped children. The cooperative nature of programming for handicapped children in Michigan facilitates service provision within intermediate districts. However, because of the sparse distribution of the population in the northern portions of the state (Region I: 5,496 in 1985-86, Special Education Student Count), specialists in adaptive technology or sites demonstrating this technology may not be easily accessed. On the other hand, handicapped students residing in areas with a high population density (Region V: 73, 071 in 1985-86) benefit from the availability of devices and professionals experienced in the use of adaptive technology.

Existing State Resources for Special Education Technology

Michigan's 22 Regional Educational Media Centers (REMCs), created in 1970, represent and serve Michigan intermediate school districts. Housed in the REMCs, the Special Education Learning Materials Centers (SELMACs) provide inservice training and purchase instructional material for use by and with handicapped students. Part of Michigan's Comprehensive System of Personnel Development, the SELMACs serve both general and special educators. Curriculum Resource Consultants (CRCs) operating from the SELMACs provide direct service to educators.

A related state-initiated project, Project ACCESS, has as its purpose the implementation of the Special Education Technology Plan. Activities include: hardware, research and evaluation, demonstration mini-grants, a series of two-day state-wide conferences, the ACCESS newsletter, and an electronic network.

The Coalition of Organizations in Michigan to Promote the Use of Technology in Education (COMPUTE) is composed of representatives from all segments of education, including universities, support service personnel, administrators, special educators, curriculum resource consultants, software developers, and general educators. Functioning as an independent field-based advisory committee, COMPUTE works with the Department of Education, Special Education Services, to assist in the achievement of objectives in the Special Education Technology Plan.

The Artificial Language Laboratory, located at Michigan State University in East Lansing, Michigan, is a multidisciplinary research center. In addition to its research focus, the Artificial Language Lab also investigates the process of successful customization and modular manufacture for individuals.

Several of the larger school districts in Michigan have developed programs related to high-technology for the special education population. Operating out of Northville Public Schools, the Communication Enhancement Resource Center designed and markets the Audiocom, an auditory scanning communication device. In the Wayne County Intermediate School District, the Adaptive Devices Advanced Methods Laboratory focuses on developing low-cost microprocessor-based voice output communication aids and adaptive computer entry systems which may enhance the communication and cognitive skills of the school-age handicapped population. Oakland School's Communication Enhancement Center in Pontiac, Michigan, is a Model Outreach Site for the American Speech-Language-Hearing Association.

Michigan manufacturers of adaptive technology include Shea Products (Special Friend), Intex Micro Systems, (Speechaid, ICOMM), Artic Technologies (SynPhonix, Artic Vision, Business Vision) and Votrax (Votalker). Wright and Filippis, a major vendor of medical equipment in the

state, also is the prime vendor of adaptive technology, and provides equipment demonstrations and rehabilitation engineering services.

Funding for Assistive Devices

In addition to the typical funding sources for adaptive technology, Michigan has a unique program for meeting the needs of students with handicaps. Section 55 of the State School Aid Act provides funds for the purchase of equipment designed for handicapped pupils with communication disorders, the cost of testing handicapped pupils to determine the need for specialized communication enhancement equipment, and equipment for training handicapped pupils with communication disorders. In the 1986-87 school year, $400,000 was appropriated for this purpose.

Reimbursement to the local school district is prorated. This funding is especially useful to students with multiple handicaps who function at a low cognitive level, a population for whom third-party funding is usually unavailable.

All of the above have a significant impact on how the LLRC delivers services to clients in Michigan. An integral part of the Special Education Technology Plan, the LLRC has organized to serve as a centralization of local, state, and national resources dealing with similar populations. The prime focus is, therefore, to meet needs which are not yet met and to cooperate with and complement other resources already in existence. An informal network of agencies and individuals in Michigan already exists. In addition, the LLRC utilizes the specific capabilities of other agencies and individuals whenever appropriate. For example, the LLRC is an active member of COMPUTE, which brings together educators throughout the state. The distribution network of Project ACCESS also disseminates information from the LLRC.

Service Delivery Program Components

Based on the overall goal and related objectives of the LLRC, the following emerged as priorities for the LLRC service delivery components.

Objective #1: The LLRC will evaluate equipment for individuals with handicaps

Because of its accessible, central location in the state, the LLRC is ideally situated for a demonstration center. In its computer room are an array of voice output communication devices, specialized voice or Braille output computer equipment for the visually impaired, and adaptive computer peripherals for the physically handicapped. Because of its vocational component for the visually impaired, the Centre includes IBM-PC-compatible computers as well as Apple IIes. All computers have speech synthesizers installed; individual computers are set up for specific purposes or use, for example, connected to a Braille printer or equipped with a keyboard emulator and adapted keyboard.

Because of the isolated location of some school districts, an additional activity of the LLRC is to locate programs throughout Michigan which can serve as satellite locations for the demonstration of selected adaptive devices.

To facilitate access to current and accurate information, the LLRC maintains files on manufacturers of adaptive equipment. Additionally, the LLRC is in the process of developing databases on equipment/software and on state and national resources dealing with adaptive computer technology. Both of these databases are in a form accessible by individuals with visual impairments.

LLRC staff also queries two national databases, ABLEDATA and the American Foundation for the Blind database, when appropriate.

Since the opening of the LLRC in October, individuals, professionals, caregivers, and students have visited for demonstrations of equipment and software. Many guests come with a specific purpose in mind, e.g., to learn about equipment which may benefit them or a particular individual, or equipment being considered for purchase. Individual educators schedule consultations to work with specific equipment or software or to copy public domain software for home or school use.

Objective #2: The LLRC will identify modifications of tools and/or the work environment for individuals with handicaps

Based on input from the Agency Oversight Committee, LLRC staff provides information to clients and professionals regarding adaptations to increase the effectiveness of vocational placement.

Adaptations for individuals with visual impairments are a major emphasis. The instructor/technician from the MCB grant is available to demonstrate and advise on forms of computer output (large print, Braille, speech) for individuals with visual impairments. Clients include public school students planning to enter an institution of higher learning or to train for a vocation, individuals in jobs which now require the use of computers, or those seeking information on what may be available.

For older severely involved students, selection of an adaptation may require consideration of social, educational, and vocational factors. For example, the choice of a communication device for a college-bound high school student may depend not only on its communicative capabilities, but also on its capability to interface with a computer or environmental control device.

Objective #3: The LLRC will serve as an information clearinghouse

The LLRC functions as a statewide clearinghouse on information regarding the selection, use, or availability of adaptive technology. Requests received through phone, conventional mail, electronic mail, or in person are routed to the appropriate staff member. Many inquiries can be answered immediately; however, others may require extensive staff research. Typical responses include technical assistance; suggestions concerning devices or software which may be appropriate; provision of manufacturer, vendor or resource material; or referral to another organization. For each informational request, the staff maintains client sheets which provide a record of the service provided.

As part of its cooperative relationship with Project ACCESS, the LLRC reaches special educators and administrators through the ACCESS Newsletter. Other avenues of printed information distribution include the PIAM (Physically Impaired Association of Michigan) publications, PAM Assistance Centre publications, and various professional newsletters.

LLRC staff are active on several local and statewide electronic bulletin boards, with the LLRC Bulletin Board/ACCESS and SpecialNet as the most frequently utilized.

Objective #4: The LLRC will provide professional development training

The LLRC serves as a resource to teacher training institutions in Michigan. The Departments of Counseling, Educational Psychology, and Special Education, College of Education, Michigan

State University, utilize the LLRC as a practicum site for graduate students majoring in the field of visual impairment. In development is a database of resource agencies and individuals in Michigan who can be contacted for assistance in selecting, acquiring, and handling adaptive devices.

Staff from the LLRC participate in in-service activities and conferences throughout the state, coordinating presentations with professional organizations and school districts. Inservice topics range from a general overview of LLRC services to in-depth presentations on a specific subject. To assist individuals and professionals in the selection of adaptive devices, the LLRC has begun a series of "Adaptive Technology Overview Afternoons." These Friday afternoon inservices introduce a selected adaptive device through videotape and staff demonstrations, and allow for audience input and questions.

Objective #5: The LLRC will conduct diagnostic assessments and consultations

A future goal of the LLRC is to conduct diagnostic evaluations of potential users of adaptive devices, and to provide recommendations, technical support, and follow-up. Until the multidisciplinary team necessary to conduct diagnostic evaluations is in place, the LLRC is focusing on providing consultations.

After receiving a request for a consultation, an LLRC staff member contacts the referring professional to obtain additional information about the individual and the task for which an adaptive device is being considered. Consultations usually require an initial visit of several hours with the client and accompanying individuals, and follow-up visits or communications. A typical consultation consists of three parts:

1. Additional discussion with the client, professional team members, and caregivers to further clarify the need for an adaptive device. Team members may include a general educator, speech clinician, physical or occupational therapist, or special educator.
2. Preliminary selection and trial of devices or adaptations which may be appropriate. At this point, the client's team, client, caregivers, and LLRC staff attempt to narrow down the possible choices and determine the best possible "match" of client needs and abilities with adaptive technology.
3. Summing-up and provision of information regarding the adaptations or devices which emerged as potentially useful to the client. Depending on the nature of the client's disability, LLRC staff may also recommend additional resources for specialized services, such as rehabilitation engineering.

For use by LLRC staff and by other professionals, a collection and database of evaluation forms and hardware and software which can be used for diagnostic evaluation purposes are under development.

Loan Program

Evaluation of an individual for an adaptive device may require trial use of the equipment in the individual's environment. For that reason, obtaining equipment for loan purposes became a major priority.

At present, the LLRC administers loan of equipment purchased through a grant to PIAM. This equipment, whose availability is designated for use by Chapter I students, represents the beginning of a loan bank of equipment. Before equipment is released on loan, the borrowing school

district returns a signed "Loan Agreement." The professional who will be conducting the trial evaluation is required to pick up and return the equipment in person, to receive preliminary instruction on the device, and jointly, with a LLRC staff member, to fill out a listing of equipment components and accessories. Equipment is loaned for a period of three months, with provisional extension depending on circumstances and demand for the device.

Selected items are also available for loan to clients of the Michigan Commission for the Blind, and may be signed out by MCB personnel. To facilitate maximum use of equipment, the LLRC will serve as a depository for devices no longer in use by the individual or school district for whom they were purchased. These devices will then be made available for short-term evaluation purposes to school districts. Furthermore, the staff is in the process of surveying Michigan REMCs and SELMACs to develop a Michigan-wide inventory of adaptive devices which may be available for loan between school districts for a designated time. In this case, the LLRC will serve as the "linker" between local educational agencies, and facilitate, rather than perform, equipment loan.

CONCLUSION

It is anticipated that as the LLRC develops and as new needs emerge, additional areas of service delivery will emerge. Plans for the future include:

1. Distribution and/or development of printed and audiovisual materials for professionals, caregivers, and individuals on a variety of topics dealing with the use of high technology.
2. Expansion of the loan program already begun, along with training materials to accompany equipment being loaned.
3. Additional avenues for reaching students and professionals in areas of the state which have a low population density.
4. Development of a complete multidisciplinary team for diagnostic evaluation purposes.

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CHAPTER 4

AN OUTREACH PROGRAM: ADDRESSING THE NEEDS OF THE PHYSICALLY IMPAIRED IN RURAL COMMUNITIES

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This presentation outlines the implementation of an interdisciplinary approach to providing on-site evaluation and consultation to nonspeaking orthopedically handicapped students in public schools. Background information regarding the development of this program as it impacted the delivery of services to a low incidence population in a predominately rural state will be presented. Additional factors for enhancing the quality of service delivery will be discussed.

INTRODUCTION

The l960s was a decade of heightened interest in the civil rights of all citizens. This growing concern for individual rights produced many changes, one of the most important being the changing attitudes of the general population toward the handicapped. A significant result of this phenomenon was that legislation began to reflect those concerns. Parents, professionals and educators questioned the benefits of institutionalizing handicapped children. Many parents were convinced that the home and community setting was the best environment for their child. Consequently they sought local services for their children and this led to the adoption of a series of laws which culminated in the passage of the "Education for All Handicapped Children Act of 1975." This law required state and local educational agencies that accepted federal funds to provide a free and appropriate public education for all handicapped children. Emphasis was to be placed on special education and related services, designed through the Individual Education Plan (IEP) process, to meet the unique needs of each child.

Financial resources in many areas of the United States were inadequate to meet the special education needs of the handicapped. For that reason the 1975 act extended federal assistance to states for developing research, surveys, demonstration projects and model programs relating to education of handicapped children. According to the federal guidelines of PL 94-142, a minimum distribution of Title VI-B funds required that 75% go directly to school districts, 5% be applied to administrative costs, and 20% be used by each state at their discretion. In Arkansas, 76% was provided to individual school districts and 19% was to be used in the discretionary pool.

The availability of these discretionary funds, coupled with an acute awareness providing appropriate services to orthopedically impaired students. A dual purpose was served in targeting the orthopedically impaired. Arkansas' Title VI-B discretionary funds were designated specifically for low-incidence handicapping conditions. Easter Seals already served this population through its preschool, residential school and outpatient infant program. A staff of therapists and educa-

tors already possessed the expertise necessary to facilitate optimum physical and educational performance. Further motivation was supplied as former Easter Seal residents were mainstreamed into public schools throughout the state. It quickly became apparent that public school teachers were unprepared to meet the special needs of these students and few therapists were available to provide the related services these students required in order to benefit from special education.

PROGRAM DESCRIPTION

During the first grant year, 1979-1980, the Executive Director of Easter Seals and the Federal Grants officer for the State Department of Education organized program objectives and procedures outlining the delivery of evaluations and on-site consultations utilizing a team of Easter Seal therapists and educators. The primary objective was to maximize the school performance of orthopedically impaired students through the delivery of direct and indirect services by assisting school districts in providing an appropriate educational program for orthopedically impaired students in compliance with PL 94-142.

To meet these goals, the evaluation/consultation process was geared toward helping school staff, the orthopedically impaired student, and his/her family solve educational, behavioral and physical management problems that prevented these students from receiving the full benefit of a public education.

Originally, students were to be evaluated at Easter Seals in Little Rock, Arkansas, by a team of therapists, including occupational and physical therapists, speech-language pathologists, educators, a social worker and psychological examiner.

Following the evaluation, Easter Seal personnel would travel to the school to provide in-service training to the individuals delivering direct services. Reference material and written instructions were provided and Easter Seal personnel were available for consultation when special problems arose. Follow-up visits to the school during the year were planned to ensure that therapies and programs were effective in reaching the goals established for that student.

Feedback from school personnel and families indicated that the on-site portion of the Outreach consultation was the most effective part of the project. Consequently, the following year the Outreach team (still consisting primarily of Easter Seal staff) provided the evaluation/consultation at the individual's school or home if so arranged by the school.

Services

The services offered during the evaluation/consultation visits included:

A. Evaluation
   1. Psychological
      a. Intelligence (level of functioning)
      b. Emotional adjustment
      c. Psychosocial relationships (self-image, school adjustments, peer relationships)
   2. Therapy
      a. Speech and language (augmentative communication)

b. Gross and fine motor skills
c. Sensorimotor integrative functioning (visual-perceptual skills)
d. Self-help skills (dressing, feeding, hygiene and and assistive devices or equipment needed for these)
e. Functional mobility (wheelchair, walker, etc.)
f. Pre-vocational assessment

3. Educational (special)
   a. Achievement testing
   b. Computer use in classroom (accessibility, peripherals)
   c. Behavioral management
4. Adapted Physical Education
   a. Motor skills
   b. Leisure activities

B. Consultation
1. Direct Services
   a. Providing advisory assistance in writing IEPs
   b. Assessing architectural barriers
   c. Determining activities to promote: pre-speech and language development; augmentative communication systems; articulation; gross and fine motor skills; sensorimotor/perceptual motor skills and classroom functioning, e.g., writing, reading.
   d. Loaning equipment on a short-term basis, e.g., augmentative communication devices, feeding systems, positioning equipment, computers, etc.
   e. instructing in therapeutic handling and facilitation
   f. Adapting classroom seating and wheelchairs
   g. Integrating computers into curriculum, interfacing with augmentative communication devices
   h. Adapting games and activities for physical education and recreation
2. Indirect Services
   a. Locating available services and resources in the community
   b. Assisting in locating funding sources for equipment
   c. Providing inservice training for therapists, teachers and aides
   d. Sponsoring and presenting at regional and statewide workshops

Staff Development

The 1979-1980 grant from the Arkansas Department of Education provided staff positions for a project specialist, a psychoeducational examiner, and an administrative assistant. The project specialist served as program coordinator and occupational therapist, while the psychoeducational

examiner provided expertise in testing non-speaking and orthopedically impaired students. All other therapy evaluations (speech and physical) were provided by inhouse Easter Seal personnel. Requests for services began to surpass the availability of the inhouse therapists, and plans for expanding the Outreach staff were incorporated into the 1980-1981 grant application. Positions for a physical therapist and a psychoeducational examiner for the hearing impaired were filled that year. In 1982-1983 the grant was amended to incorporate augmentative communication evaluation services and a speech-language pathologist was employed. Staff turnover left the program at the end of the year with only a project specialist. During the 1983-1984 grant year, additional occupational, physical and speech therapy services were provided on a contract basis. The 1984-1985 grant provided positions for a full team of therapists, which was hired by mid-year. Since that time the Outreach staff has consisted of a coordinator, an occupational therapist, a physical therapist, a speech-language pathologist, a special educator and an adapted physical educator. Additional contract services were provided by a physical therapist and three psychoeducational examiners through 1986-1987.

Admission Criteria

Orthopedic impairment as defined by PL 94-142 includes the following diagnoses: amputations, arthritis, cerebral palsy, muscular dystrophy, spina bifida and traumatic injury. Students age 5-21 with one or more of these diagnoses who attend public schools were eligible to receive Outreach services. All referrals to Outreach were received through the local education agency (LEA) Supervisor. (See Appendix A, at the end of this chapter, for referral process flow chart.)

Although public schools were Outreach's target sites, the program also served orthopedically impaired students placed by their school district in other educational settings, such as Developmental Disabilities Day Service Centers.

Outreach also provided services to preschool students and others who were undiagnosed, but had symptoms of orthopedic impairment, such as limited reach or unusual gait. These children were served under the authority of the Child-Find provisions of PL 94-142 and the state's Special Education regulations.

PROGRAM STRUCTURE

All students were referred to Outreach through their LEA Supervisor. If teachers, parents and/or directors of Developmental Disabilities Day Service Centers referred a student, the LEA for that school district was contacted by the Outreach Coordinator. A referral packet was mailed to the referral source and upon receipt of the completed packet the visit was scheduled. A referral packet contained the following forms: information/referral, social-developmental history, informed consent for release of records, and publicity release. The Outreach Coordinator assigned appropriate staff specialists and approved a team leader who would schedule the appointment, plan the evaluation/consultation schedule, and lead the entrance and exit conference.

Upon arrival at a school, the LEA Supervisor and other members of the school staff who were directly involved with the referred student(s) conferred with the Outreach staff. Parents were invited to attend the entrance conference at the discretion of the school.

Following this conference, Outreach evaluated the student and, during the consultation that followed, equipment loan possibilities were explored. If equipment for ongoing evaluation purposes was needed, the loan procedure was completed. The need for other referrals was also discussed and assistance provided in locating appropriate resources.

Outreach staff, school personnel, parents and the student, when appropriate, participated in the exit conference. Evaluation findings and recommendations were reviewed orally and a written report followed within one month of the visit.

Equipment, if loaned, was returned by the school within the designated time frame, typically six to eight weeks. Upon the request of the school, parents, or student for a follow-up visit, the Outreach Coordinator notified the LEA Supervisor and the procedural process for a school visit was reinstated.

During the fiscal year, the Outreach Coordinator was responsible for monitoring all aspects of the Outreach Program. The Director of Outpatient Children's services assisted as needed in program management and the Easter Seal's accounting department provided billing and payroll services. The State Department of Education Special Education Division and the Federal Grants officer monitored the program at the end of each fiscal year.

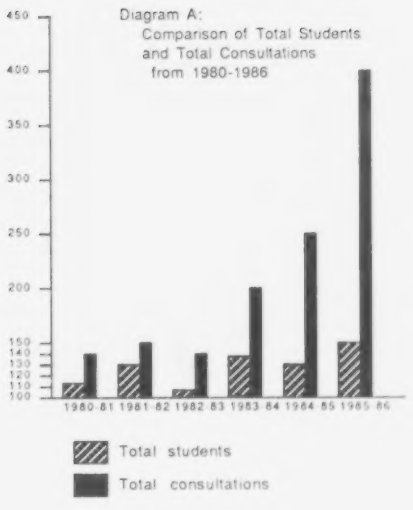
EVALUATION OF IMPACT

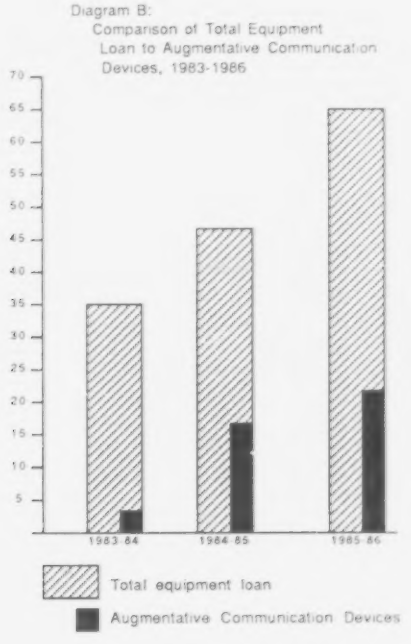
A review of services provided during the first seven years (1979-1986) of operation revealed a steady increase in both the quantity and quality of services. Each year, the number of students served, equipment loaned, and workshop participants rose as did the number of services offered. Staff training through continuing education opportunities and experience gained from working as a team also contributed to increased quality of service.

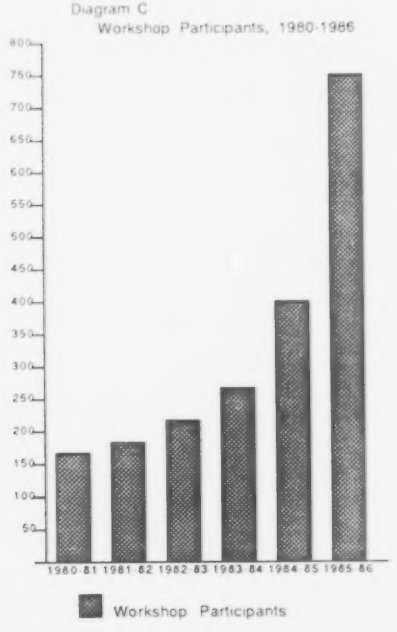
During the 1979-1980 grant year, approximately 110 students were seen by a combined Outreach team and Easter Seal core staff. Incomplete records prevent comparison of that year to the following six. The number of students served from 1980 to 1986 reflect a steady increase in requests for Outreach services. Each year all appropriate referrals were completed with the exception of a backlog of cases at the end of the 1982-1983 school year. Those students were seen the following year. From 1979 to 1984 service requests were met by a combined Outreach and Easter Seal core staff. By mid-year 1984, the Outreach staff had expanded to three full-time and three part-time consultants and the Easter Seal core staff was no longer utilized on a regular basis (Diagram A.)

The equipment loan program was established during the third year of operation (1983-1984). Loan protocol required that each piece of equipment be evaluated by the Outreach therapists, and if continued use was recommended, a short-term loan was instituted. All appropriate personnel were instructed in the proper care and maintenance of the equipment. This loan program enabled school districts to evaluate the effectiveness of special equipment, such as augmentative communication devices, computers, feeding systems and alternate positioning systems before making purchase decisions. During the first loan year, a total of 35 pieces of equipment was loaned, 3 of which were augmentative communication devices. In 1985 and 1986 total equipment loan increased to 46 items and 65 items, respectively. The number of augmentative systems loaned during those two years was 16 and 24, respectively. (See Diagram B.) By 1986, over 100 items were available for loan. (See Appendix B, at the end of this chapter.) As a result, 40 students have utilized augmentative communication systems at home and in school. Funding for augmentative communication systems for students evaluated by Outreach has been obtained through public school districts, Children's Medical Services and private fund raising. Individual public school districts purchased five augmentative communication systems based on the Outreach interdisciplinary team evaluation. Children's Medical Services is a Division of Social Services through the Arkansas Department of Human Services. Criteria for approval on three augmentative communication systems included the interdisciplinary team evaluation and a physician's prescription. Private fund raising for one augmentative communication system included a

benefit concert. Presently funding for two ACSs is pending with Arkansas Blue Cross/Blue Shield.







The greatest area of increased services was evident in the number of workshop participants, which rose from 160 in 1980 to 740 in 1986. (See Diagram C.) Outreach was able to provide therapists and educators with valuable training in their own schools and communities. Often professionals in rural communities were isolated and would have been unable to pursue continuing education opportunities otherwise.

Many school therapists and educators were not equipped to deal with the specialized needs of the orthopedically impaired student. Training was necessary in order to help them more accurately assess a student's abilities, especially if that child was nonverbal in addition to his physical limitations. Teachers and aides had to become familiar with techniques to prevent abnormal muscle tone from interfering with class work, and how to position a child to facilitate his best response. Guided hands-on experience was often required before school staff could therapeutically feed a child who was unable to chew and had difficulty swallowing. By providing both statewide and regional workshops that covered these and many other topics, Outreach was able to assist school districts in creating more knowledgeable persons within their own communities.

LONG-RANGE PLANS

A number of factors were identified as potential areas of expansion for Outreach services. One such area was the need for consultative services and workshop training for school staff regarding pre-vocational programming and vocational readiness; along with this there would be a greater need for more intensive training of therapists and educators in augmentative communication and computer interfacing. An expansion into this area of need would require the addition of a therapist with experience in pre-vocational programming as it relates to school-aged clients. Because this type of service has not been utilized in the past, and only recently has it come to the forefront in education, this position would be best designated on a contract-for-service basis.

Second, an early identification screening service would identify children in public school kindergartens with minimal brain dysfunction or mild cerebral palsy. Planning services for early intervention and remediation would then be more effective. The 1987 legislative session of the Arkansas General Assembly will consider House Bill 1383, which authorizes such a program.

An expansion of the interagency cooperation already in effect would be to utilize Outreach to train and establish other teams, each physically located in Arkansas regional educational cooperatives. Eleven regional centers have been established at this time. If these centers each housed service teams, school districts would then have more immediate access to therapy evaluations, in-service training, workshops and equipment loan. Therapists would travel only in specific regions rather than covering the entire state, thereby allowing frequent follow-ups and increasing the quality of service each student received. Gradually, Outreach would concentrate more in the area of training and equipping individual regional centers, and less on providing direct services to students. This would allow the state to comply with the Education of the Handicapped Amendments of 1986, in PL 99-457.

SUMMARY

The collaboration between the State Department of Education and the Arkansas Easter Seal Society resulted in a service that was able to channel available federal funds to provide a service that neither organization could have provided alone. Over a seven-year funding period, the total cost of operation was $809,357.00, bringing the average cost per client served to $924.00. (See Appendix C.) It is unlikely that the Easter Seal Agency would have operated this program if it de-

pended on contracts with each school district for reimbursement. Without such federal assistance, the needs of the children served by this program would, in many cases, have gone unmet.

Various programs geared specifically toward evaluating students' communication and seating needs have been developed throughout the United States. Evaluation centers offer valuable assistance in providing appropriate recommendations, but often those left to carry them out have not received adequate instruction to ensure follow-through. The greatest strength of the Arkansas Outreach program has been its on-site service delivery model. Each student was evaluated in his school environment, and all recommendations were attempted and demonstrated to school personnel. The reports were written in terms that parents and laymen could easily understand. Follow-up visits and telephone conferences allowed continued contact with the student and school in order to resolve any difficulties that arose.

An ongoing challenge identified over the seven-year period was the inevitable turnover in school personnel and the need for new staff to be trained. Schools have not always recognized the importance of follow through and carry over from year to year, on their part, regarding solutions achieved in classroom adaptations, the use of special equipment, and educational programming, etc. This information was not always passed on to subsequent teachers. Each year the wheel was reinvented, and valuable time lost from that student's academic schedule. The need to communicate this responsibility was vital if Outreach was to have any lasting impact on the education of orthopedically impaired students.

In an attempt to remediate this situation the Outreach team members must ensure that school personnel understand the importance of sharing consultation results with new teachers, aides and therapists. Prior to scheduling a school visit, the team leader should be responsible for helping school personnel determine how they can get the most out of the consultation process. This will require increased pre-site contacts. All consultations should end with an oral review of evaluative findings in an exit conference; school personnel should be encouraged to write down information reviewed; and a tape recording of the conference left at the school. Copies of the report should be kept readily available and be read by all persons working with the student.

The struggle to obtain civil rights for handicapped individuals has not ended simply with the passage of a series of laws mandating equal educational opportunities. Just as attitudes and conventions have begun to change in regard to discrimination against persons due to race and sex, so too will many attitudes and prejudices have to undergo radical changes before physically handicapped students experience the fruits of an appropriate education.

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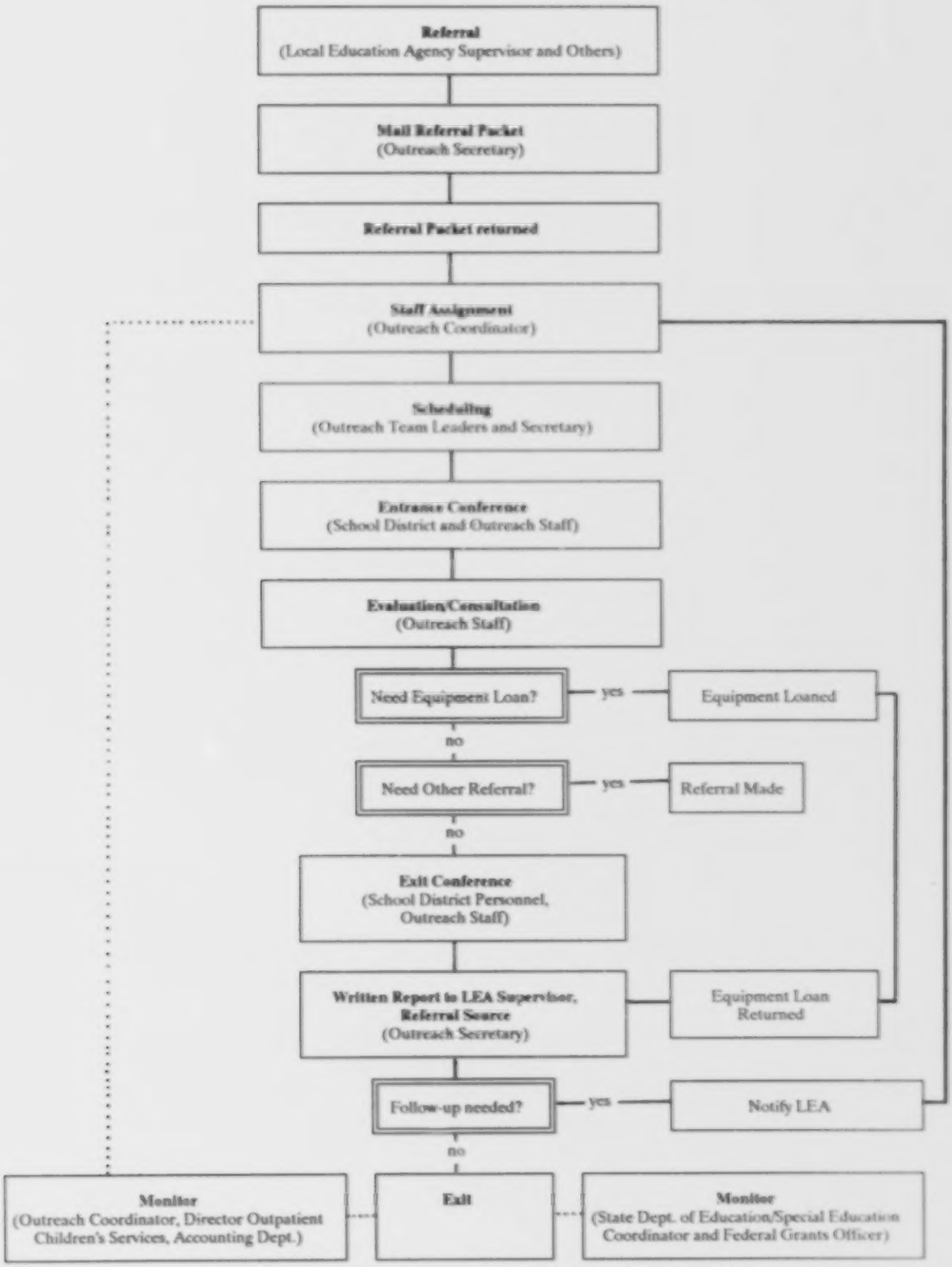
APPENDIX A: OUTREACH PROGRAM STRUCTURE FLOW CHART



NOTE: Students exit the program each year but may re-enter each year to age 21

APPENDIX B

EQUIPMENT LIST
JANUARY 1987

Chairs/Seats:

BC 162.....Large corner chair on casters with tray
SI 125.....seat insert (MPI)
FIO5 small.....Tumbleforms feeder seat
FIO5 large.....Tumbleforms feeder seat
SI 115.....Seat insert (blue)
SI 116.....Seat insert (blue)
CS 208.....Carrie seat/tumbleforms with tray, footrests, head support
CC 163.....Corner chair (large) Kaye Products on casters with tray
BC 138.....Bolster chair with tray
BC 200.....Bolster chair
CC 146.....Corner chair on casters with tray
BMcll2.....Bobby Mac car seat
BC 160.....Bolster chair
BC 139.....Bolster chair on casters with tray and footplate
SI 140.....Blue
CC 132.....Corner chair without roller base

Standers

FS 143.....Flexistand (Mexico) with pelvic and chest band
PS 118.....Prone stander

Wheelchairs and trays

WC 1.....Wheelchair
WC 189.....Wheelchair (growing)
PB 104.....Pogon Buggy
WcT 102.....Tumbleform wheelchair tray
WT 207.....White wheelchair tray/adjustable
LT 217.....Wheelchair tray/adjustable
PB 218.....Pogon Buggy II

Walkers

W lO6L.....Folding walker
W lO7L.....Folding walker
W lO8S.....Folding walker with rolling front wheel
W 169.....Walker large
RW 215.....Rolling walker (4 wheels)
RW 216.....Rolling walker (2 wheels)

Bookholders

BH 191 ..... Book holder
BH 134 ..... Book holder (easel type)
E - 170 ..... Acrylic bookholder
E 165 ..... Desk top easel
E 172 ..... Wooden easel
E 201 ..... Wooden easel

Feeders

CPFE 159 ..... CP feeder electric
CP-142 ..... CP feeder

Therapy Equipment

SB 168 ..... Scooter board (blue)
RB 150 ..... Rocker board
W 131 ..... Wedge (green with velcro strap)
SB 137 ..... Brown scooterboard
SL 117 ..... Side lyer
B 209 ..... Small blue bolster (UALR)
B 210 ..... Red bolster (UALR)
B 211 ..... Blue bolster (UALR)

Toilet and Bathroom Equipment

BSC - 110 ..... Bath support chair
TS 127 ..... Toilet seat (yellow)

Miscellaneous

SB 190 ..... Sliding board

Computers

AC 100 ..... Apple II E 2 disc drives
#1334726
#824745
AC - 167 ..... Apple computer
M - 196 ..... Apple color monitor
Serial #5057216
ETP - 129 ..... Electric typewriter printer
ETP - 130 ..... Electric typewriter printer
EC - 114 ..... Epson computer and case
Serial # 11743
IBM 202 ..... IBM color monitor
IBM 203 ..... Dual disk drives
IBM 204 ..... IBM keyboard
IBM 206 ..... IBM keyguard
IBM 208 ..... IBM software

E 213 .....Brother printer
C 212 .....Power Pad (peripheral)

OUTREACH EQUIPMENT NOT TO BE LOANED

C - 201 .....RCA Camcorder
Camera 54963025
Viewfinder 549630205
Adaptor 545280119
Accessories:
lenscap, carrying handle, shoulder strap, ear phone, AC adaptor/charger, standard battery 08060, audio/video output cable

SP - 120 .....Slide projector
C - 121 .....Carousel
C - 122 .....Carousel
C - 123 .....Carousel
C - 124 .....Carousel

Augmentative Communication

Z-201 .....Zygo Adaptor (PCR)
WP - 153 .....Words+ Portable Voice
WM-K - 188.....Wheelchair mounting kit
WCMK - 55
WCMK - 4
SP 204.....Message Maker, Type and Speak
(Touch & Speak software programs)
SW - 186.....Radio Shack's on/off footswitch
SW - 187.....Radio Shack's on/off footswitch
SW - 184.....Radio Shack's on/off footswitch
SW - 183.....Burkihart's head control switch mercury)
SW - 179.....Kanor's vertical plate switch
SW - 200.....Kanor's vibrating plate switch
VC - 156.....Vocaid serial #1102 430
SW - 201.....Mini-rocking lever switch set 25-0
TT - 175.....Touch Talker Model TT-1 ser #325
V - 177.....Vois 135 ser #85120123
HP - 198.....Zygo Headpointer Ad-1
SW - 203.....Kanor's push on push off module
JS - 174.....Joystick model JS-4 for Light Talker set 45-T
LT - 176.....Light Talker model LT-1 Ser# 170
MIN - 157 .....Minspeak serial #9

OH - 173 ..... Optical Headpointer model OH-2
Viewpoint Optical Indicator VOI-6
OH-2 serial #180
VOI-6 serial #62

EXP - 155 ..... Express III serial #337

EC - 206 ..... Kanor's environmental control switch

EK - 195 ..... Expanded membrane keyboard lot #30136
Model 1 Unicorn

ET - 159 ..... E-Tran

C - 182 ..... Kanor's Clock Communicator

C - 199 ..... Kanor's Clock Communicator

CC - 192 ..... Canon Communicator serial #M600154

CC - 193 ..... Canon Communicator serial #M600155

AC - 205 ..... Aug. Comm Assessment Resource

AT - 202 ..... All Talk serial # 132 (accessories include: battery charger, microphone, cassette tape recorder, 2 gray cables, 4 small square overlays, 5 square overlays

AFC - 197 ..... Adaptive Firmware Card serial #846986
Version 2E

AT - 191 ..... Adapted toy music box TV (Kanor)

P - 194 ..... Epson Spectrum LX -80 printer
Model #P82RA serial #04011926

TT 205 ..... Touchtalker

SP 207 ..... Speech Pac with Epson (EC 114)

ES 214 ..... Echo Speech Synthesizer

APPENDIX C
TITLE VI-B FUNDING

Total project requests:

1979 - 1980	$59,386.00
1980 - 1981	$78,108.00
1981 - 1982	$66,742.74
1982 - 1983	$105,246.83
1983 - 1984	$91,190.21
1984 - 1985	$153,842.81
1985 - 1986	$217,540.00
1986 - 1987	$208,914.00
Total cost:	$809,357.00

Total number of students served: 876

Average cost per student $924.00

CHAPTER 5

THE IMPLEMENTATION OF THE SERVICE DELIVERY SYSTEM AT THE ROCKY MOUNTAIN REGIONAL CENTER FOR AUGMENTATIVE COMMUNICATION AT MEMORIAL HOSPITAL OF BOULDER

PRESENTER: Judith Haddow, M.A. CCC-SP
Department of Speech Pathology

Memorial Hospital of Boulder (MHB) is located in Boulder, Colorado, a city with a population of 80,000. The hospital is a 93-bed facility with 26 beds allotted to rehabilitation patients. The Rocky Mountain Regional Center for Augmentative Communication (RMRCAC) is part of Physical Medicine and Rehabilitation Services, and offers assessment and treatment services to nonspeaking children and adults on an inpatient and outpatient basis. Additional information on MHB and demographic issues specific to Boulder and the state of Colorado are contained in "The Planning of the Service Delivery System at Rocky Mountain Regional Center for Augmentative Communication at Memorial Hospital of Boulder," contained in these proceedings.

ISSUES IN SERVICE DELIVERY IDENTIFIED BY PRESENTER

Several issues were identified between 1980 and 1983 regarding service delivery for nonspeaking children and adults in Colorado. One was the lack of a centralized facility with state-of-the-art equipment and an integrated interdisciplinary team with adequate clinical expertise in augmentative communication. Clinicians in the public schools provide therapy services for a broad population of children, and generally do not have the time necessary to keep current with new developments in specialized areas of treatment.

Rapid technological advances require administrative time, funds for new equipment, and extensive continuing education for smaller school districts, which may have only a handful of children requiring these services.

Yet these children's needs must be met, and augmentative communication systems are sometimes prescribed by those who are unaware of all of the available options. The systems may not meet the child's current or future needs. If an inappropriate device is purchased, the parents, educators, and insurance company may be skeptical if asked to fund another device in the future. The child may be left without a functional means of communication.

An ongoing problem is lack of knowledge on the part of Medicare, Medicaid, and third-party payers regarding the need to fund these devices. The staff at RMRCAC is involved in the continuing education of funding sources, but success has been limited so far.

Initially, local school districts were hesitant to refer to an outside facility for assessment. Special Education Directors said that they were afraid that they would be "locked in" to rigid recommendations and forced by federal law to purchase equipment that they could not afford. The

RMRCAC staff met frequently with the Special Education Directors in the Denver metro area to determine an appropriate report format to meet the child's needs most effectively. The staff of RMRCAC, public school personnel, the patient and his/her parents act as a team in determining the most appropriate augmentative communication system. If possible, the team offers several options for systems in a wide price range, with suggestions on how to implement these systems into the child's home and school environments. The advantages and disadvantages of each system are explained and the ultimate decision of what system to purchase is made only after trial periods with loaner devices obtained either from local vendors or from MHB. The RMRCAC staff attends school staffings and parent/teacher conferences on request to provide any additional information.

ISSUES IDENTIFIED BY THE GREAT LAKES AREA RESOURCE CENTER

The delivery system at RMRCAC is organized by the augmentative communication team coordinator. The service delivery model was developed by a team of therapists working with the Colorado Department of Education (CDE). CDE allots funds on a case-by-case basis for "Difficult to Assess" children. Application is made by the local school district or administrative unit, and funds are channeled through the administrative unit which pays MHB when billed for services provided. In an agreement with CDE, a ceiling of $800 per assessment placed on the cost of each evaluation and a 15% discount on cost of services is provided for those with "Difficult to Assess" funding. Parents are always encouraged to explore private insurance funding prior to application to the Special Education Director for "Difficult to Assess" funds.

Hospital staff members act as liaisons between local equipment vendors and the clients and teachers to arrange for loaner devices, in-servicing and training on the equipment. Once the initial contact is made between the vendor and the school personnel, it is the responsibility of the parents and the school staff to contact the vendor for equipment delivery and maintenance. If problems arise, RMRCAC staff members are available for continued consultation.

A request for an assessment can be made in writing or over the telephone. When a request is made, an augmentative communication questionnaire and pediatric case history form are mailed to the school, generally to the child's speech-language pathologist. This person obtains the necessary information from the child's parents, teachers, and other therapists, and returns the information along with recent medical, cognitive, psychological, and language test results to RMRCAC. With severely involved children, a video tape is requested in addition to written reports. While video tapes can provide valuable information, the RMRCAC staff recognizes the need for specific guidelines of behaviors and situations to include in a video tape. Future plans include the development of a video tape protocol.

When the information is received, an appointment is made for the assessment. Generally, a single day is scheduled, with most assessments taking three to four hours. If additional time is needed, another appointment is made to reduce the negative effects of fatigue on the child's performance. Prior to the assessment, the RMRCAC staff reviews the child's records and decides which pieces of equipment seem likely to meet the child's needs. The equipment is programmed with specific personal information for that child, and any equipment not immediately on hand is obtained from local vendors.

Preferably one or both parents, the child's teacher and speech-language pathologist, as well as the child's occupational or physical therapist, are present at the assessment. The RMRCAC team consists of two speech-language pathologists, an on-call rehabilitation engineer, an occupational therapist, and a physical therapist. Two RMRCAC speech-language pathologists are usually necessary because of the complex problems presented by severely motorically and speech-language

impaired children. One clinician interacts directly with the child while the other addresses questions to those who accompany the child, observes the child's responses and helps problem-solve equipment needs during the assessment.

"Release of Information" forms are signed by the child's responsible party at the time of the assessment. Reports are sent to the parents, school, and often to specific equipment vendors who carry the devices that are recommended in the report. Release of information to equipment vendors only occurs if authorized by the responsible party; however, this technique saves time when the system is being set up in the home and school, as the report may contain recommendations for specialized adaptations of equipment that are difficult to explain in a phone call.

Postcards are sent 1 month, 6 months, 12 months, and 18 months after the assessment requesting a return letter or phone call regarding the child's status. Parents and the school speech-language pathologist receive these postcards. If updates in equipment or additional training of school staff or parents are needed, this is provided. Information on possible funding sources and letters to insurance companies are provided upon request. An issue that has not been resolved at RMRCAC is charging for extensive and time-consuming follow-up services. Since not all children require these services, it seems unfair to bill for future services at the time of the assessment. Often these services are provided free of charge, but because of concern over staff productivity, alternative procedures are being investigated.

The hospital allots eight hours of administrative time per week for the development of the augmentative communication program. This time is used for scheduling, development of policies and procedures, and investigation of new equipment. In addition, the staff is paid for time spent in providing in-services to school districts, presentations to local service and philanthropic groups and development of public service and media contacts. A significant amount of time is spent making educational contacts on a one-to-one basis with speech-language pathologists and intensive care nurses of acute care facilities, directors of nursing at extended care facilities, public school speech language pathologists and special education directors, funding sources, and insurance companies. The hospital Marketing and Public Relations Department is ultimately responsible for the development of brochures, press releases, videos, and public service announcements, with input from the augmentative communication team regarding content.

Individual therapists are provided with approximately $400 per year for continuing education. Each therapist determines which conferences and workshops he or she would like to attend, and pays for any costs above the funds allotted by MHB. It has been determined that about $1,000 would be more ideal, based on the amount of national travelling, and the number of technological advances occurring each year.

One factor in developing this model was the hesitancy of local school districts to refer their children for "out of district" assessments. There are only a handful of districts in Colorado which rarely, if ever, refer for "out of districts" assessments. But thanks to many meetings, compromises, and open lines of communication, most districts seem comfortable with referring children to RMRCAC on a case-by-case basis. Because cost effectiveness has become very critical to most hospital administrators in recent years, and because of the initial high cost of equipment purchases, this was a factor in the development of the RMRCAC program. MHB has an agreement with Abbey Medical Supply, a Denver medical supply house. Their augmentative equipment representative has worked with our staff for several years and provides equipment for assessments and loaner devices upon request. In addition, the representative attends the assessments or follow-up conferences when necessary to address specific equipment problems. Several specialized and expensive pieces of equipment which the hospital does not directly own are on long-term loan to the facility. Because of this agreement RMRCAC is able to provide state-of-the-art equipment

to inpatients and outpatients. In addition, MHB has approximately $40,000 in hospital-owned equipment for use by inpatients and for outpatient assessments. The entire speech-language pathology staff has been trained to use the hospital's equipment and it has been integrated into therapy with any appropriate patients. Some equipment, such as the Apple IIe computer, is used for head injured, language-learning disabled and general pediatric patients, as well as nonspeaking patients. The therapists also use this equipment for word processing, data storage, and scoring tests. Approximately 30% of our referrals are adult inpatients and outpatients. Referrals come from other speech-language pathologists on staff, nursing homes, physicians, and relatives of nonspeaking individuals. Services to these patients usually encompass treatment as well as assessment.

The rapidly advancing technology in augmentative communication demands continued upgrading of current equipment, as well as purchases of new equipment and software. In 1987, MHB allotted $16,199 for new purchases in augmentative communication equipment.

At this time, MHB does not have a formal "mobile unit," although out of town assessments are performed on a case-by-case basis. The cost of a van and additional equipment is high, personnel costs for travel time are high, and we have found that equipment suffers with long trips. For example, software can malfunction after drastic changes in altitude encountered in airplanes and automobile travel over high mountain passes. Reprogramming the equipment is time consuming, inconvenient, and sometimes impossible at the assessment site. A "cost of travel" formula was developed which incorporates equipment transportation charges, airfare, meals, lodging, salary of augmentative communication team members, and salary of on-call personnel who are covering the regular staff's case load. The cost of staff travel to the patient's home town versus the patient's travel to MHB is computed and the figures are presented to the party requesting the assessment. MHB will provide airfare for the child and one parent, plus provide lodging in a hospital-owned apartment if this will significantly reduce the cost of the assessment. The choice of using this service or bringing the assessment team to the child's home town ultimately rests with the parents and the school district. Often it is too expensive to travel 200 miles to assess one child, but administrative units have requested assessment for four to six children over a three-day period, and this arrangement is often more cost effective than travelling to assess one child. Unfortunately, the wear and tear on both staff and the equipment is considerable. The Colorado mountains and unpredictable weather make automobile travel difficult and sometimes unsafe. Air travel is less time consuming but damage to software and delicate electronic equipment is a constant fear. Staff members must make family and child care arrangements, and all therapists must find substitutes for their regular patients or cancel their regular therapy sessions. On trips longer than one day, the staff have found that they spend much of their time writing reports late into the night, because they will be doing two more assessments the next day. The staff report that out-of-town assessments requiring an overnight stay are exhausting, and they feel that their work suffers because of it.

One problem encountered with out-of-town assessments, in addition to those mentioned above, is inadequate or inaccurate reporting of a child's current level of function. The RMRCAC staff plan the equipment to bring based on the information obtained from the parents and administrative unit. On several occasions, the staff have arrived to find that the child is actually functioning at a much lower level cognitively and/or motorically and they have to quickly improvise to obtain accurate information in the assessment.

A major and undeniable benefit of out-of-town assessments is observing the child in his own environment. Another benefit is the input received from people who work with the child on a daily basis. For example, the child's classroom aide may not be able to accompany the child to the hospital, yet this person may have excellent information on the child's functioning in the classroom.

Also, the RMRCAC team can often observe the child with his siblings and classmates, which gives important information about his current communicative skills. The assessment report provides, whenever possible, a list of several augmentative communication options with suggestions for implementation in the school and at home. Special Education Directors specifically requested that the reports not recommend the purchase of a specific system, as they felt that they might be forced, under PL 94-142, to purchase a system when they felt that it would not be appropriate. While the team understands their concerns, the staff could not ethically agree to this request. For some children, there may be only one piece of equipment that is a viable communication system. For other children, several systems may meet their needs, and in those cases it is professionally responsible to describe all of those systems. The staff attend staffings and conferences and provide written suggestions for implementation of the system at home and in school. Telephone consultations and in-person visits are common after the assessment and the patients have not been charged for this service.

An interest group of augmentative communication users, parents, and professionals was formed in 1983. The Rocky Mountain Communication Group (RMCG) meets every other month during the school year. It is a nonprofit organization with minimal annual dues charged to professional and corporate members. RMCG provides educational presentations, new equipment demonstrations, information sharing, and support for any interested parties. Its current membership is 300 people.

In an attempt to obtain funding for patients, the staff have developed ties with the Sertoma Club and other philanthropic organizations. They provide in-services to user groups for people who have had strokes, multiple sclerosis, Parkinson's, cerebral palsy, and Huntington's disease, in order to increase public awareness of augmentative communication and the needs of nonspeaking people. Referrals from the Department of Social Services and CDE have increased as their staff become more aware of the potential for augmentative communication devices to expand an individual's ability to communicate wants and needs.

In Colorado, augmentative communication was initially a grass-roots movement with a small group of therapists and educators meeting informally. Through CDE awareness workshops, Colorado Speech and Hearing conferences, and the efforts of RMCG, this network has expanded. Information sharing and equipment exchange, however, is still conducted on an informal basis.

Establishment of an interstate consortium would be very desirable. There have been cases of patients who have been charged as much as $1,000 more for a piece of equipment in one state than they would have paid in Colorado; through improved interstate communication between service providers, increased consumer protection would be provided. If CDE and private augmentative communication centers had more knowledge of available service delivery systems in other states, appropriate referrals would increase, follow-up and continuity of treatment would be more thorough and consistent, and the clinical competence of case providers would improve through better communication.

DESCRIPTION OF PROGRAM MODEL AT RMRCAC

If a child's parents originate the request for an augmentative communication assessment, MHB informs the parents that it is advantageous to inform the school of the referral. Written authorization from the parents is necessary to inform the school. MHB also informs the parents that the school is not responsible for the cost of the assessment or bound by the recommendations of the hospital staff. If the parents request that the school system be responsible for the assessment, MHB refers the parent to the Director of Special Education of their administrative unit and notifies the school system of the referral.

When a request for an augmentative communication assessment originates from the school system, the administrative unit has two options. If the administrative unit is responsible for all costs relating to the assessment, it may refer to any facility or private clinician it chooses. If financial assistance is sought from the CDE, eight steps are involved.

1. If assessment information is more than one year old, a comprehensive assessment is conducted by the administrative unit in all functioning areas: cognitive, social/emotional, educational/developmental, physical and communicative.
2. The staffing committee recommends to the Special Education Director that an additional assessment for augmentative communication purposes is necessary.
3. The Director of Special Education requests assistance from CDE for "Difficult to Assess" funds.
4. The Special Education Director includes copies of the assessment reports or a one-page summary of the results in the request to CDE.
5. CDE retains the right to make the determination of the most appropriate facility or clinician to do the augmentative communication assessment.
6. Within 30 days, CDE informs the Special Education Director whether the request has been approved, the costs for which CDE will assume responsibility, and the name of the facility to which the referral is made.
7. The local school personnel make all arrangements with the identified facility.
8. The school obtains a release of information authorization from the child's responsible party, and forwards all requested information to the hospital or facility conducting the assessment.

Rocky Mountain RCAC conducts the assessment in accordance with the administrative unit's request and takes part in follow-up staffings, which may be conducted at the school, hospital, or any other place mutually agreed upon by representatives of the hospital and administrative unit and parents. The hospital staff makes its recommendations in terms of characteristics of services that focus on options for the child, descriptions of devices, and the needs of the child. The hospital forwards all billings to the local school district/administrative unit. The local administrative unit pays the facility or clinician, and then submits a request to CDE for reimbursement of the actual cost or the amount that CDE has agreed to pay for the assessment.

Should the school staffing team recommend that specific types of equipment be purchased for an alternative mode of communication, the school district/administrative unit may request that CDE assist in payment for the equipment or loan its own equipment.

At Memorial Hospital of Boulder, the model for service delivery is a dynamic one, requiring flexibility and commitment from the hospital administration and the professional staff to remain viable. As public school speech-language pathologists become more aware of the benefits and options involved in augmentative communication, the hospital role has changed. With local clinical expertise improving, referral patterns to MHB have changed. The children now require more advanced technological aids, and school personnel require more detailed and extensive information on computers, software, and special adaptations to equipment. Through good communication between the Colorado State Department of Education and Memorial Hospital of Boulder, continuing staff education and commitment, and administrative support, this basic model continues to serve the needs of nonspeaking children in Boulder.

CHAPTER 6
A CENTER-BASED MODEL FOR EVALUATION OF AUGMENTATIVE COMMUNICATION NEEDS

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BACKGROUND

The technology now exists that allows persons with little or no intelligible speech, and without the fine motor skills for written expression, to participate more fully in the educational process. Many of these individuals have disorders that interfere with their ability to be understood by family, teachers and other persons with whom they wish to communicate. Assistive devices, interface modes and augmentative communication techniques have been developed that give pupils the opportunity to communicate independently.

The student can participate more fully in the classroom and the teachers can realistically evaluate educational progress. With the increased ability to communicate, the students have the opportunity to participate in a less restrictive environment, attend a wider variety of classes and work in regular school programs. Independent communicators become active participants in the educational process and no longer need to be dependent on others to make choices and speak for them. They can initiate social interaction and gain control of their environment and their futures.

SERVICE DELIVERY ISSUES

The selection and modification of assistive communication systems must be highly individualized to meet needs effectively. High-tech communication aids are costly to purchase, and low-tech aids are costly in time needed to develop and to use. Consideration should be given to the increased staff time required for severely handicapped pupils. A variety of service delivery models are possible to meet the needs of individuals with severe expressive communication handicaps. These can include service at the local school, county or state wide programs, interdistrict consortiums, contracting with hospitals or private agencies, and combinations of these.

The students may be served by the program at a centralized site or by a team of professionals which comes to the local school site. Which service delivery options are selected will depend both on the resources and on the needs of the agency and population served. Significant service delivery issues can be divided into two general areas: 1) effectively meeting the needs of individuals with severe expressive communication disabilities, and 2) practical and efficient use of resources.

To ensure efficient use of resources these questions should be considered:

1. What population will be served -- number, disability type, communication needs?
2. What resources are presently available?

3. Who will be responsible for which task administration, training, implementation?

Screening or staff surveys can be used to identify the population which needs to be served. A statement of philosophy and objectives should be developed which is compatible with school or agency policies. It should be broad enough to encourage establishment of effective communication in all settings, and include a means of review as the program evolves.

Resources should be identified, including review of how communication needs are addressed presently, locating staff members or consultants with expertise in augmentative communication, finding or organizing training opportunities, and contacting other agencies serving the population. Access to existing resources should be explored (e.g., clerical, electronic repair or maintenance, transportation, vocational workshops). Funding sources, including grants, insurance, third-party payment, school purchase, community resources, and one-time budget expenditures, should be identified. When these needs and resources are known, eligibility criteria and referral guidelines should be developed to determine who will be served initially. To meet communication needs effectively, these questions should be asked:

1. Is an identification and referral process available?
2. Does the staff have expertise in the field of augmentative communication?
3. Is a comprehensive evaluation provided?
4. How will recommendations be implemented?

Staff training and parent information sessions should be organized to ensure identification and referral of nonspeaking/nonwriting individuals. An evaluation team should include staff members who have expertise in speech and language theory, educational/social/cognitive/vocational development, augmentative communication theory and technology, seating and positioning, technical adaptation and repair. Staff members should have specialized training in the field of augmentative communication and the opportunity for continued professional growth. Implementation plans should include integration of communication aids in all settings, and should foster the participation of the family. An array of materials and high-tech aids should be available for the evaluation and for the use of the nonspeaking individual.

NONVERBAL ASSESSMENT PROGRAM OF THE LOS ANGELES UNIFIED SCHOOL DISTRICT

A center-based program was selected by the Los Angeles Unified School District (LAUSD) to provide comprehensive identification and evaluation of services to meet the needs of nonspeaking pupils in this large urban school district. Over 729,000 students are enrolled in the LAUSD. The Special Education Division through Special Schools, Special Day Classes and Itinerant Designated Instructional Services serves approximately 50,000 students. The Speech and Language Unit of the Division of Special Education developed a Non-Verbal Assessment Center and later added a mobile unit and two satellite centers to serve LAUSD pupils who demonstrate severe handicaps in communicating and/or conveying thoughts expressively. The pupils may be enrolled in a special school, in a self-contained class in a regular school program, be mainstreamed with itinerant services, or be in home or hospital schools or in nonpublic schools. Since 1980, nonverbal evaluations have been completed for over 475 pupils. Approximately 80 pupils receive an in-depth nonverbal assessment each year. Pupils evaluated have a variety of disabilities or handicapping conditions. Approximately 250 pupils using augmentative communication systems are served at their local school by itinerant speech and language specialists and classroom teachers, with consultation from the Non-Verbal Assessment team.

Pupils Served 1985/86

Ages	Program	Number
3-12	Orthopedically Handicapped	72
13-22	Orthopedically Handicapped	58
3-12	Multiply Handicapped	22
3-22	Multiply Handicapped	16
3-12	Trainable Mental Retardation	33
13-22	Trainable Mental Retardation	5
3-22	Severely Handicapped	11
3-22	Visually Impaired	3
3-22	Deaf and Hard of Hearing	7
3-22	Autistic	6
3-22	Severe Disorders of Language/Aphasia	7
5-18	Speech/Articulation Disorders	5

The Non-Verbal Assessment Program is staffed by speech and language specialists knowledgeable in assessment, etiology and behaviors of nonspeaking pupils, as well as in the field of language development and language disability, and are California licensed and ASHA certified. Staff members have developed expertise in the recent technological advances that permit communication devices to be used as tools for learning and communication. The team includes occupational therapists, physical therapists and school psychologists to select and individualize appropriate communication systems.

Administrative Support and Resources

The Non-Verbal Assessment Center was initiated to ensure the provision of a proper evaluation prior to the implementation of augmentative communication systems. The advantages of this model of service delivery include efficient use of personnel resources by location of staff members with expertise in a central location, with access to a comprehensive array of materials, switches, devices, and aids. A professional library and numerous opportunities to attend appropriate conferences have been provided to support the professional growth of staff members.

A variety of school district resources have been made available to the assessment program. Clamps and supports designed by a staff member to attach switches and equipment to wheelchairs are fabricated by pupils at an Occupational Center. Repair and maintenance is available through district electronic and computer shops. Transportation is available to bring the students to the centers. The mobile unit is maintained by district mechanics.

The centers are housed at special education schools and have the resources of these schools available including assistance with the needs of visiting pupils. The use of school sites for the centers allows field testing of ideas with students enrolled at those sites. Also there is a barrier-free access to the facilities. The physical and occupational therapists of California Children's Services (a county administered state program) are also housed at the school sites. Via an interagency agreement these therapists are also members of the nonverbal assessment team.

During the eight years since the inception of the Non-Verbal Program, as needs have been identified and resources have become available, funds and staff time have been increased and have been provided by the District. Especially significant has been the continuous acquisition of more versatile augmentative equipment. It was decided that equipment and materials should include assistive devices representative of each type of communication system and switch available. Also

included were receptive language tests, journals, books, and a diverse array of pictures and symbols to develop low-tech communication aids.

Initially, funds from individual special education school budgets were used to provide needed aids for individual students. As the assessment program acquired a larger library of aids, equipment was available for both evaluation and for long-term loan to individual students. Modification of guidelines and the service delivery format has been made periodically.

Program guidelines are reviewed and changed periodically. When the augmentative systems and techniques were initially implemented and students became independent communicators, administrators and staff wanted to make the assessment program available to many additional students. So the eligibility criteria, which initially required that the communication problem be a result of a severe motor or neurophysiological disability, were changed to include other etiologies including retardation and emotional handicaps.

To reduce the time needed to transport students to the central site, a mobile unit was acquired to provide assessment in geographically remote areas of this 708-square-mile district. The van was fitted with a wheelchair lift, generators and air conditioning, cupboards, shelves, and electrical outlets. The unit was driven by the speech and language staff members from site to site and was stored in the district bus yard when not in use. This allowed the staff to observe communication needs and skills in the student's own classroom, and facilitated the involvement of family and teachers.

The service plan was modified again to implement two satellite assessment centers in diverse areas of the district. All three centers serve as resources for the school staff and families. The availability of the three centers facilitates the opportunity for observation of the program by members of the community, university students and professionals.

Summary of Timeliness for Implementation of the Evaluation Program

Year 1: Survey needs, field test ideas, seek administrative support, develop guidelines, select site, identify staff and resources, prepare budget, find funding, order supplies

Year 2: Set up center, receive equipment, in-service staff, continue field testing, implement referral procedure, begin assessment and implementation.

Year 3: Evaluation program in effect, continue staff in-service, field testing, document effectiveness.

Year 4: Continue evaluation and staff in-service, review and modify objectives, delivery plan to improve implementation.

Funding Resources

Funding for the program came from a variety of sources. State-administered federal grants (Title IV B) for library equipment and materials were used to acquire devices, switches and equipment. Starting in the 1985-1986 school year, the state of California provided funds for students who require costly materials to meet educational needs. These students are those with "low incidence" disabilities including physical handicaps, hearing handicaps and vision handicaps.

Examples of Acquisition of Equipment Funded by Grants

1979-1980: $13,000 (assistive devices to equip center)
1980-1981: $14,000 (aids for center and loan to students)
1981-1982: $12,000 (to equip mobile van)
1984-1985: $12,000 (for satellite center and student use)

Equipment Acquisition Funded by State Programs

1985-1986: $40,000 (for a third center and student use)
1986-1987: $15,000 (for long-term student use)

Instructional materials, phone, and housing costs were funded by the Special Education division and the Speech and Language unit budget. Initially, $5,000 was budgeted for modifications, furniture and materials to equip the center. The Non-Verbal Assessment Center is a small classroom which has been remodeled to add locking cabinets and outlets for charging communication aids. Also purchased were desks, tables, bookcases, file cabinets, phone, and chairs for pupils and adults.

The speech and language specialists on the staff are released from the itinerant Designated Instructional Services program. Their case loads are absorbed by other itinerant speech and language staff members to maintain the district's required 55 student average. School psychologists provide information from their assessments or are given time to participate in the evaluations. The occupational and physical therapists are county (not school district) employees who participate actively with pupils who are their clients and, through interagency cooperation, are available to evaluate referred pupils who are not on their case loads.

Maintenance and transportation costs are absorbed by the existing school district programs to provide such services. Clerical support was funded by the Division of Special Education for the first two years of the program. Presently, the clerks in the speech and language office serve the assessment centers. An additional classroom assistant is assigned to each of the schools where the centers are housed. This person provides caretaking assistance to students who come to the centers for evaluation.

Issues Addressed by a Center-Based Model

The center based Non-Verbal Assessment Program provides the efficient utilization of available resources. This model addresses many issues for provision of service to this population. A major weakness of this service plan is the difficulty fostering active involvement of families and staff in the evaluation and implementation process because of the remote sites. The need to improve integration of communication systems into a wider variety of areas of the pupil's life experience has been identified. The Non-Verbal Assessment team provides consultative services to families, to special day class and itinerant staff, and to classroom teachers to meet these goals.

The transition of special education students into regular education has been facilitated by the provision of assessment and support services by the nonverbal team. As students move from special education schools to programs on regular campuses, needed devices or systems are made available. Several students who previously had attended special education schools have been able to attend classes on regular campuses.

Administrators and teachers depend on the expertise of the nonverbal staff to select communication systems for their schools and classrooms. This includes selecting, ordering and instructing in the use of equipment. California Children Services, families and group homes use the assessments to select and implement appropriate augmentative communication systems. Reevaluations are scheduled when indicated to assist in transferring a student from an unaided device to more sophisticated aid device or to introduce a communication system, e.g., signing. The rehabilitation technician is available for fitting wheelchair mounts, repairing switches, and adapting interfaces. Switches are fitted individually and modified as positioning changes, or pupils receive new wheelchairs.

The Non-Verbal Assessment Program is viewed as a resource by school and community groups. The centers have attracted over 400 observers including professionals from other states and countries. They also serve as training sites for local university students who will be entering the field of speech and language.

Suggested Tasks for Initial Implementation of a Center-Based Strategy

1. Identify interested staff members who:
   a. have or are willing to develop expertise,
   b. review literature,
   c. attend conferences, and
   d. visit other sites.
2. Receive commitment of administrators by explaining:
   a. the positive educational effects of independent communication,
   b. the technology and techniques that now exist, and
   c. the right of all pupils to be able to communicate.
3. Survey needs identifying the:
   a. number of students needing service,
   b. type of handicapping conditions, and
   c. training needed by staff members.
4. Identify resources including:
   a. who is presently serving those pupils,
   b. available consultants, and
   c. other agencies providing service.
5. Determine if a centralized site is the efficient way to provide:
   a. access to a varied array of equipment at one site,
   b. service to a sufficient number of pupils in the program, and
   c. a well-trained staff available to meet pupil needs.
6. Locate a site which is:
   a. geographically centralized to serve all areas of the region,
   b. accessible to the disabled, and
   c. adequate with space available for staff, students and equipment.
7. Contact other agencies/departments to seek the involvement of:
   a. speech and language specialists,

   b. physical and occupational therapists,
   c. school psychologists, and
   d. engineering or technical support staff.

8. Begin staff training including:
   a. theoretical and practical issues,
   b. manufacturer demonstrations,
   c. explain identification and referral process, and
   d. field test implementation ideas.

9. Determine guidelines for referral determining:
   a. basic readiness skills required for referrals,
   b. identification of who will be responsible for which tasks, and
   c. how recommendations will be implemented.

10. Set up budget identifying:
   a. minimum needs for staff and supplies,
   b. interim sources lease, loan,
   c. ideal needs for staff and supplies, and
   d. maintenance and repair plans.

11. Find funding including:
   a. grant proposals,
   b. adjustment of existing budgets, and
   c. identification of community resources.

12. Order equipment and supplies with:
   a. a representative variety of augmentative systems, and
   b. materials for developing personal communication boards.

13. Initiate program by:
   a. borrowing or leasing needed supplies,
   b. beginning evaluations,
   c. assisting staff and families with implementation of ideas, and
   d. monitoring effectiveness of the use of augmentative systems.

14. Review program periodically to allow:
   a. loan of equipment as an inventory is accumulated,
   b. redefinition of objectives and guidelines as program needs change, and
   c. professional staff development and training.

The above list represents suggested tasks that are needed in the initial stages of developing a center-based evaluation program. The objectives of a program need to be adjusted periodically and should include clear plans to implement recommended communication techniques and systems.

Summary of Current Guidelines for LAUSD Non-Verbal Assessment Program

The Non-Verbal Assessment Program was established to meet identified needs through federal funding under the Elementary Secondary Education Act Title IV-B, in 1980. The objectives of the Non-Verbal Program are:

1. To assess referred non-speaking or minimally intelligible pupils, ages 3-21, who regardless of etiology, demonstrate severe handicaps in communicating and/or conveying thoughts expressively.
2. To select, adapt, modify, and program the most appropriate communication techniques and/or devices that will provide a functional expressive communication system for these pupils.
3. To provide training and follow-up services to the pupil and family as well as school and California Children's Services personnel.
4. To reevaluate pupils previously provided with a communication device and/or system.

Procedures

Principals, speech and language specialists, and teachers at special education schools refer individual students to the Non-Verbal Program. Students are assessed at one of the centers, or on the mobile unit. The assessment is completed by an interdisciplinary team of professional people which may include occupational and physical therapists of California Children's Services, the school psychologist, and the team of speech and language specialists.

The assessment begins with the occupational and physical therapists who determine the best means for the student to activate a switch in order to operate a device. The student then tries a model of the device and interface.

Academic tests are administered by school psychologists if results have not been previously provided. Language tests are provided by the speech and language specialists who complete a comprehensive description of the communication needs. A composite written report is sent to the referring school, therapy units and parents. An Individualized Education Program (IEP) is developed to implement the needed augmentative communication program at the school.

Equipment is loaned to the local school for interim use and available to the student in the classroom when personal devices are not available. The student's parents, home school speech and language specialist, the classroom teacher, and occupational and physical therapists are given instruction in the use of the device.

The Non-Verbal Assessment team members are available to provide adaptations, assistance, and consultation as needed to implement the recommended program. Periodic reevaluations are scheduled to monitor the pupil's progress and determine appropriate modifications to the communication program.

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CHAPTER 7

MINNEAPOLIS PUBLIC SCHOOLS AUGMENTATIVE SERVICE DELIVERY SYSTEM

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PHILOSOPHY OF MINNEAPOLIS PUBLIC SCHOOLS AUGMENTATIVE COMMUNICATION SERVICES

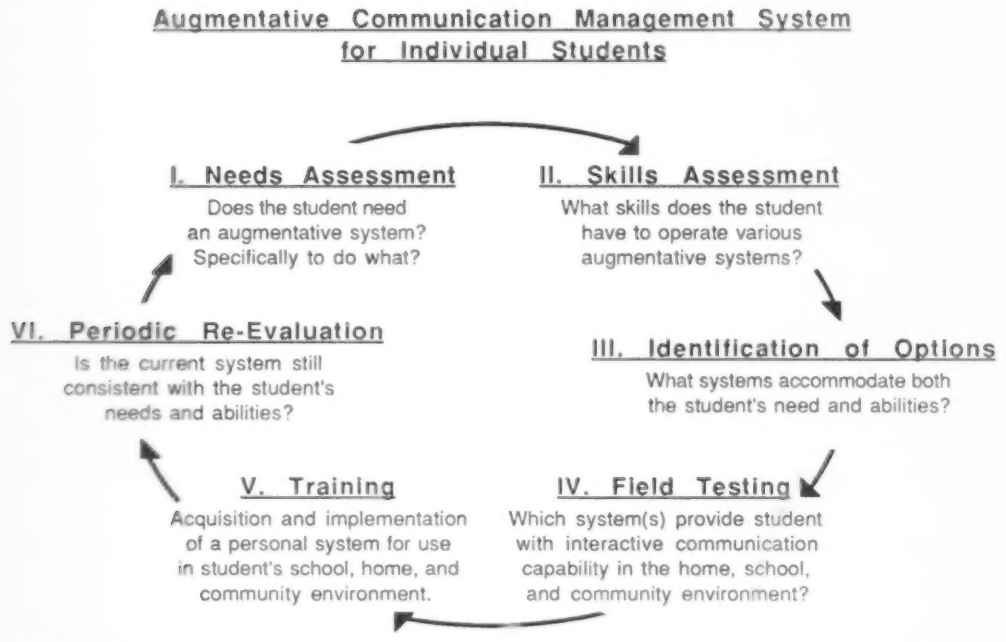
The Speech-Language Program for communication-handicapped students is committed to optimal development of speech as the most efficient mode for most purposes of interpersonal communication. However, the Minneapolis Public School system must serve a number of students who, for various reasons, have little likelihood of developing functional oral communication. The purpose of augmentative communication service delivery, as a function of the Minneapolis Public Schools Special Education Speech-Language Program, is to train the students, who need augmentative systems and persons within the student's environment, to interactively use an aided system which ensures access to communication opportunities in the student's educational, home, social, and, when appropriate, vocational environments. Augmentative communication is defined in the Minneapolis Public School, as any approach designed to support, enhance, or augment the communication of individuals who possess limited communication skills.

ORGANIZATION OF THE AUGMENTATIVE COMMUNICATION SERVICE DELIVERY SYSTEM

To meet the needs of those students who may be candidates for an augmentative communication system, a process which incorporates several components has been developed and implemented over the past two years. These components include:

- a comprehensive, systematic, districtwide process for referral;
- transdisciplinary assessment, field testing, and collection of field test results;
- device acquisition, device adaptation; and
- training to integrate use of the selected augmentative system into the educational, social, and vocational life of student users.

The objective of the assessment, field test, and training process is to select, acquire and train the student, and persons within the student's environment, to use an augmentative communication system which ensures the student access to and integration within the student's educational, home, social, and in some cases, vocational environments. Service delivery data, including student progress monitoring results, are collected and analyzed. The resultant information is used for data-based program policy and procedural decisions. In essence, the augmentative communication student service delivery management system includes the following parameters.


Augmentative Communication Management System
for Individual Students
I. Needs Assessment
Does the student need an augmentative system? Specifically to do what?
II. Skills Assessment
What skills does the student have to operate various augmentative systems?
III. Identification of Options
What systems accommodate both the student's need and abilities?
IV. Field Testing
Which system(s) provide student with interactive communication capability in the home, school, and community environment?
V. Training
Acquisition and implementation of a personal system for use in student's school, home, and community environment.
VI. Periodic Re-Evaluation
Is the current system still consistent with the student's needs and abilities?

Citywide Augmentative Team

Diagnostic, field test, and training services to augmentative system users, as well as staff, parent, and community in-service training activities, are coordinated by a centralized augmentative service team. This team includes the Speech-Language Program Coordinator, three half-time speech-language pathologists, and an occupational therapist who is assigned to augmentative services for 12 hours per week. Team members are selected by the coordinator on the basis of their knowledge of augmentative communication systems, adaptive/assistive devices, and consultative skills. The responsibilities of this citywide team are as follows:

With coordinator,

1. provide consultation to building-based staff for assessment, fieldtesting and integration of augmentative system into the student user's school, home, and community environment;
2. facilitate equipment acquisition, dissemination, and repair;
3. assist Management Information Systems Department with procedures for data collection, analysis and report generation;
4. design and implement inservice training activities for professional and paraprofessional staff and parents; and
5. provide requested technical assistance to school districts, community agencies and consumer groups.

Building-Based Staff

There are 41 schools in the Minneapolis Public School system. Speech-language clinicians, social workers and other special education personnel are assigned to provide services to handicapped students attending school in these sites. For those handicapped students requiring special educa-

tion services for more than 50 percent of their school day, i.e., severely physically, cognitively handicapped and/or emotionally disturbed students, specialized special education programs are provided within the 41 building locations. Services to individuals who may require augmented communication are provided by building-based personnel with assistance from the citywide augmentative team. Requests for this assistance are submitted to the speech-language coordinator.

Training Service Delivery Continuum for Augmentative Communication Systems Users

The service delivery for students identified as augmentative communication systems users, whether that system is a picture communication board, Bliss Symbolics, sign language or a high technology microcomputer with synthesized speech, is provided with a continuum of instructional options for skill acquisition and interaction in the student's school, home and community environments. Exemplary service delivery strategies include the development of systematic communication board design and training; an interactive users' group; classroom integration; a computer training lab for secondary students; communication cards for vocational/community training sites; and Camp Courage -- a summer camping experience. Student progress is systematically monitored with precision teaching process monitoring strategies. Whatever the instructional methodology used, teachers, parents and other significant persons are trained to interact with the student and the student's communication system.

Equipment Library

A library of high technology equipment, assistive devices, and materials for fieldtest purposes is maintained in a centralized location. Equipment requests from citywide augmentative team members and/or building-based staff are submitted to the Speech-Language Program Coordinator for approval. The approved requests are then given to the Equipment Coordinator, a member of the citywide team, for processing. A computer-based system for equipment acquisition, dissemination and repair is maintained. A budget of $30,000 to $40,000 per year for the past two years to acquire an inventory of equipment has been appropriated and funded by local school district monies. Equipment is repaired by manufacturer's warranty, district personnel, or a volunteer engineer parent.

Professional, Paraprofessional and Parent Training

The design and implementation of a comprehensive delivery system for augmentative communication users has necessitated an intensive staff training process over the past three years. The transdisciplinary professional staff required training to implement assessment and field test procedures, and to gain expertise with the high technology equipment currently available on the market. An implementation training plan was developed by the coordinator and the citywide augmentative team. The professional and paraprofessional staff assigned to buildings were primarily trained by using a building cluster model followed by weekly contact with a member of the citywide augmentative team. To discuss state-of-the-art issues, share concerns and exchange information, an augmentative communications interest group has been formed. In addition to Minneapolis Public Schools personnel, membership in this group includes transdisciplinary representatives from community agencies, hospital programs, advocacy groups and parents. Facilitation of the interest group is rotated by the speech-language coordinator and/or other members of the citywide augmentative team.

As a result of our selection as a ASHA Model Outreach Site for the Delivery of Augmentative Communication Services in Schools, requests for technical assistance, including in-service train-

ing, on a local, statewide and, to a more limited extent, nationwide basis, have increased during the past year.

PROGRAM EVALUATION

Procedures to evaluate the augmentative communication service delivery system include a format developed by the Minneapolis Public Schools Management Information Service. The process includes the collection of service delivery demographics such as student name, assessment and/or field test results, professional staff involved, type of augmentative system, frequency and duration of service (e.g., 1-1 direct), interactive users group, mainstream integration, community communication menu cards, and device acquisition source. Reports are generated and disseminated to the coordinator for analysis. Yearly reports with recommendations are prepared by the citywide augmentative team.

SUMMARY

The Minneapolis Public Schools program for augmentative communication provides a comprehensive service delivery system which includes systematic procedures for referral, transdisciplinary assessment, field testing of a recommended system, interactive training methodologies for augmentative systems users, and evaluation of student/program outcome data. Service delivery problems which continue to occur include acquisition of necessary budgetary resources for adequate staffing to buildings and the citywide team, in-service training activities, and equipment procurement. As the commitment to service delivery has expanded, an increasing number of students requiring services have been identified. Efforts to train classroom teachers, parents, family members, and persons such as community recreational personnel and work supervisors to communicatively interact with the augmentative systems user needs to be intensified. Field-based research projects need to be designed, funded and implemented.

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CHAPTER 8

NON-ORAL COMMUNICATION SERVICES SERVICE DELIVERY MODEL

PRESENTER: Marilyn Jean Buzolich, Ph.D.
Non-Oral Communication Services

OVERVIEW

There are a variety of service delivery models in augmentative communication. Some are clinic-based programs while others are environmentally based outreach programs. Many service delivery models offer components of both. Through the American Speech-Language-Hearing Association's U.S. Department of Education project entitled "Implementation Strategies for Improving the Use of Communication Aids in Schools Serving Handicapped Children," it was determined that there are an increasing number of service delivery models offering assessment and intervention in the natural context. Some center-based programs are even beginning mobile units to bring the expertise of professionals out into the community.

The present paper will discuss a private community-based service delivery model in augmentative communication. This model is one which depends on a cooperative relationship with public and private agencies within the community who contract for services on a client-by-client basis. The funding for the program is supported 75% by these public contracts and 25% by private clients. This model utilizes an interdisciplinary team approach. However, the concept of a team is a dynamic one rather than a static one as the professionals presently working with the child are participants in all stages of assessment and intervention within the natural setting. Expertise regarding augmentative communication systems, evaluation, and techniques for intervention are integrated into the team and utilized for the purposes of developing an individualized education program with a heavy emphasis on augmentative communication and computer-assisted education.

ISSUES

Non-Oral Communication Services (NOCS) is a community-based private program affiliated with the Disabled Children's Computer Group, a nonprofit corporation, whose purpose is to link disabled children with computer technology that will enhance their ability to communicate, learn, work, and enjoy fuller lives. Non-Oral Communication Services identified a need in 1981 for a community-based program due to the high number of reported "failures" in implementing communication aids in the schools. These "failures" were contributing to a negative attitude toward communication aids on the part of school personnel, administrators, and third-party funding agencies. It was hypothesized that many of these "failures" were due to:

1. lack of training and experience in augmentative communication on the part of school staff;

2. the amount of indirect service time required to customize a prescribed communication aid and to meet the user's needs, e.g., establishing a functional vocabulary, programming vocabulary, designing overlays, etc.); and
3. lack of an appropriate intervention plan to facilitate functional use of the communication aid.

In-servicing and general workshops were not providing school staff with the necessary tools to help a particular student through the process of becoming an aided communicator. It was hypothesized that the school needed an itinerant specialist to:

1. work directly with students requiring augmentative communication;
2. include an augmentative communication intervention program in the child's Individualized Education Program (IEP); and
3. train professional staff to implement the program throughout the student's school day.

In addition, it was hypothesized that a home program, complementing the school program, was a necessary component to a successful augmentative communication program.

Non-Oral Communication Services has continued to grow since 1981 with a 25% increase in cases per year. There are now four speech and language pathologists on staff who have been trained as augmentative communication itinerants to meet the growing need in the San Francisco Bay Area school districts. Each augmentative communication therapist is a licensed speech and language pathologist with at least two years of experience in augmentative communication. The program director (augmentative communication specialist) is responsible for the non-oral communication evaluation and developing an individualized education program which includes recommendations for a particular communication device or system. Once the program is developed and services are contracted with the public school or agency, an augmentative communication therapist is assigned to the case and provides direct service in the school and/or home setting. The program director must maintain a good working relationship with school and agency administrators in order to maintain a steady flow of referrals and satisfaction with the services provided.

Our affiliation with the Disabled Children's Computer Group (DCCG) provides us with a network of consultants and resources to meet our long term goals of community education. DCCG is also an excellent source of private referrals from parents seeking services for their children.

OVERVIEW OF A PRIVATE COMMUNITY-BASED SERVICE DELIVERY MODEL

Communication Services provides assessments and intervention for nonspeaking, school-age children in the San Francisco Bay Area. NOCS is unique in that the expertise of professionals and the necessary technology is brought into the child's natural environment (home and school). The interdisciplinary team presently working with the child is educated throughout the assessment process and contributes its expertise and knowledge of the child to create a comprehensive evaluation. NOCS has found that utilizing the existing team is crucial for a successful intervention program. Team members and parents must agree on the child's level of functioning and communication needs. The results of NOCS evaluations yield an interdisciplinary IEP for the child which includes equipment needs, services, and continuing education of team staff. NOCS translates recommendations into goals and objectives which can easily be implemented by school staff and family.

Non-Oral Communication Services recognizes that communication is essential in order for a student to benefit from the educational setting. We consider the educational needs of the child and provide communication systems which enable the student to function in mainstreamed settings. We have experience in transitioning students through systems with increasing capabilities. As the student gains greater skill he/she is placed in less restrictive environments, with the end goal being a typical classroom. NOCS has case study data on successful mainstreaming. For multihandicapped students with significant cognitive handicaps, NOCS has had an impact on influencing schools to set up new programs that provide intensive, early intervention for preschool and young school-age students.

Non-Oral Communication Services is a private, state-licensed organization. Direct services to the client, if school age, are primarily obtained by the particular home public school district in which the child lives. These services, if provided by a nonpublic, private agency such as NOCS, are reimbursed 70% by the State Department of Education to the school district contracting with NOCS. School districts can obtain such services from a private agency if they are deemed educationally necessary by the interdisciplinary team working with the child. There is little cost to the home school district. Indirect services such as consultation to school personnel and parents, preparation of materials, making communication boards or overlays, programming vocabulary, etc., are often provided by social service agencies outside of the public school system, e.g., Regional Centers, United Cerebral Palsy, Crippled Children's Services, etc. These agencies focus on the child's total program (home and school) and will often fund a limited amount of consultation to facilitate the child's optimal functioning across his primary settings.

Through NOCS's affiliation with the Disabled Children's Computer Group (DCCG), numerous resources and equipment are available. DCCG offers numerous presentations for groups and individuals regarding technology and its application to the severely physically handicapped, nonspeaking student in the special education classroom. It has a resource center of equipment readily available to parents and professionals for use with individual students. Often DCCG is the first step for an interested parent to learn about available technology and how it might be applied to their handicapped child. As a result of DCCG, parents in the Bay Area are having an impact on the schools and accelerating the implementation of communication aids in the schools. It is important for us to realize that the parent is often the first person to initiate a request for nonoral communication. The case load of the average school clinician is too large to undertake a time-consuming effort such as this for every child who needs it.

Through the affiliation with DCCG, NOCS provides parent education, in-servicing, and support in facilitating improved use of communication aids in the schools.

PROGRAM GOALS

The primary goal of NOCS is to increase and improve augmentative communication services to the severely speech handicapped population in the San Francisco Bay Area. The population targeted by NOCS as most underserved are those in the public schools. In addition, along with the DCCG, NOCS is committed to increasing the use of computers as educational tools for the severely physically and speech handicapped individual. Students in our program have IEP goals and objectives for augmentative communication and computer-assisted education. NOCS will continue to make its services available to any individual who needs it by obtaining funding from state and local agencies. NOCS plans to continue educating professionals and the community through in-servicing, workshops, and on-site training of teachers, staff, and parents. NOCS, along with two other founders, will be opening a private school program called The Bridge School in the fall of 1987. The Bridge School will provide a model program for early cognitive and communicative development for severely physically handicapped children and an interaction classroom

for higher functioning system users. The Bridge School will illustrate the benefits of technology in enabling severely physically handicapped children to achieve the prerequisite skills necessary for utilizing a communication system. For the higher functioning students, The Bridge School will focus on interactive development so that the children can learn to use their systems effectively for interaction. NOCS is committed to research endeavors which will inevitably improve communication aids, services for augmentative system users, and educational programs for handicapped students.

STRENGTHS AND WEAKNESSES OF A PRIVATE COMMUNITY-BASED SERVICE DELIVERY MODEL

The community-based aspect of this model is undoubtedly the strongest feature of the program. In order to be truly successful, the knowledge and expertise in the field needs to be delivered to the community. It is nearly impossible for public schools to obtain evaluations from clinic-based programs and implement the recommendations independently. Recommendations need to be translated into goals and objectives for school staff. Materials, equipment, and techniques need to be introduced by an expert and the staff needs to be trained on site so that any constraints in implementation peculiar to a particular site can be identified and appropriate modifications made. In addition, follow-up must be provided on a regular and frequent basis in order to deal with the day-to-day problems in intervention and facilitate transitions at appropriate times. Finally, the staff trained to provide service for an individual student will invariably learn from the experience and bring that knowledge into subsequent cases. This obviously is a long-term benefit of this model.

The most significant weakness for this service delivery model is the fact that funding is never secure and depends on the public educational laws and the political climate. At present, the model is operating with ease due to the low-incidence funds mentioned previously and the fact that public schools are able to contract with private agencies (and be reimbursed by the state) to perform specialized services. Additionally, private agencies in the community are available to assist in home intervention and staff training. In any particular community or state the funding will vary.

Adopting this model will be dependent on the funding available within your designated area. Another big barrier in the implementation of this model is obtaining the confidence from the community of the services offered. It takes several years of good service delivery to build up referral sources and an excellent reputation. As the program expands, it is necessary to select qualified and experienced staff who will be able to perform quality service. In addition, the training of staff is a cost that must be absorbed by the private agency itself, but it is a crucial and necessary component to the continued growth of the program.

IMPLICATIONS AND RECOMMENDATIONS

The trend toward community-based service delivery models is gaining momentum. The ideal situation is obviously to combine the clinic-based and community-based components. This enables the professional to conduct environmentally based evaluations but also to experiment with the application of technology in a controlled clinical setting. For NOCS, the DCCG offers that necessary resource. An alternative is to bring the resources and equipment into the natural setting itself. The important point here is that the expertise must be brought into the community serving the population. It is only then that we can expect to substantially improve the application of communication technology and the delivery of services to the nonspeaking.

SERVICE DELIVERY MECHANISM

I. Initial referral (assessment or intervention initiated no later than one month after initial referral)

1. Telephone contact from school/agency administrator, parent, therapist, or educator.
2. Referral form completed by telephone interview to determine need for service.
3. Determine contracting school, local/state agency, or private funder.
4. Establish what services are needed and give estimate of number of hours required to complete service.
5. Obtain written referral and contract to perform service.

II. Intake

1. Assessment (completed within four to six weeks)
   a. Gather relevant written documentation on case.
   b. Review client's history.
   c. Contact interdisciplinary team and parents by telephone.
   d. Schedule site visits for observations of client and teacher/therapist/parent interviews.
   e. Formal assessment is conducted over the course of several evaluation sessions.
   f. Prepare and distribute written report.
   g. Team meeting to discuss evaluation results and intervention plan.
   h. Finalize intervention plan.
2. Intervention phase
   a. Obtain formal contract with agency, school, or private funder.
   b. Provide direct service to client on site across primary contexts.
   c. Provide consultation and training to professional staff and family.
   d. Formally meet with team to review progress every three months.

III. Discharge

1. Client is discharged when team decides client has achieved operational and functional competence with communication system.
2. Monthly follow-up program is initiated for first 6-12 months after direct service is terminated.
3. Yearly follow-up on discharged clients not receiving regular consultations.

SECTION IV: ASSESSMENT/EVALUATION

OVERVIEW

Section Four,"Adaptive Technology: Assessment and Evaluation" provides several perspectives of issues related to assessment and evaluation. The discussions acknowledge the various evaluation models which exist and, in general, support the use of modifications or variations of models based on the needs of the individual.

There is an array of issues to be considered regarding assessment/evaluation. Issues may be client oriented -- evaluation of the client, the environment, and the devices themselves -- and/or administrative such as use of appropriate staff and resources. The following questions were used in the development of the information presented in each chapter.

1. Differentiate between assessment and evaluation and their relation ship to the requirements of PL 94-142.
2. What are the various evaluation models?
3. What are some specific evaluation models that should be used for different populations with adaptive technology needs?
4. What are the underlying assumptions of these models?
5. How do they differ in regard to the following factors:
   personnel required to conduct evaluations,
   the on-going nature of evaluation,
   the need for follow-up to the evaluation?
6. What steps must be included in the evaluation process?
7. What factors allow one to determine which model or components are most appropriate for their program?
8. What should the focus of evaluation be?
9. What are the outcomes of the evaluation?
10. Who or which personnel conducts the evaluation?
11. What costs are associated with conducting an evaluation?
12. How does evaluation/assessment relate to the education process?
    Does the evaluation follow a medical model?
    Is information relative to the IEP?
13. What consideration should be given to the use of sensory aids?
14. Should one consider programs that do not include physical adaptations for hardware or software?
15. Is the LEA responsible for conducting the evaluation?
16. Does the school's re ponsibility for evaluation include considerations relative to seating, positioning and powered mobility?
17. How do medical factors relate to adaptive technology evaluation?

After reading this section the reader should have a better understanding of the role of assessment/evaluation in making decisions about client needs, how several centers are responding to the issues related to assessment, and an increased awareness of approaches that may be implemented to improve the assessment evaluation process. A summary of each chapter is provided below.

David Beukelman and Pat Mirenda, at Barkley Augmentative Communication Center, provide an overview of three evaluation models:

- the communication process model,
- the communication needs model, and
- the participation model.

Their discussion presents these models in relation to five primary goals of augmentative communication assessment and provides a comparison of the criteria used to determine needs, candidacy, intervention focus and intervention decisions. Beukelman and Mirenda suggest several decision points critical to efficient ongoing evaluation and follow-up services, and describe several barriers to effective communication assessment.

Joan Bruno and Barry Romich of Prentke-Romich Company are representative of a manufacturer/distributor, and the various services they provide. Their discussion describes the importance of establishing the purpose and goal of the evaluation prior to conducting an evaluation, and five key areas that an evaluation should address. Bruno and Romich describe aspects of the consultation model used by Prentke-Romich. They acknowledge the need to use a variation of an evaluation model and give examples of instances that may require variations. This discussion also provides some insight on the evaluation of device characteristics and issues to consider when matching the device to the student.

Sara Brandenburg is with the Trace Research and Development Center, University of Wisconsin-Madison. Brandenburg sets the stage for her discussion by pointing out the differences among several related terms and providing a definition of assessment as it relates to augmentative communication. She continues by discussing several issues to consider in establishing an effective assessment and service delivery system. These include considering the nature of the population, the need for knowledgeable professionals and materials, and the need to plan for future environments. Brandenburg provides an in-depth description of the evaluation model used at the TRACE Center with a diagramed outline of the procedures, steps and activities involved. She summarizes by acknowledging the basic strengths and weaknesses of their University/Hospital-based model and offers several valuable recommendations for individuals who are planning and implementing evaluation services.

Colleen Haney and Karen Kangas are staff members at the Pennsylvania Assistive Device Center (ADC). Their discussion provides an overview of the ADC model and their plans to train Local Augmentative Specialists (LAS) in an effort to expand their service delivery model. Their presentation describes the selection and training process for LAS, their responsibilities and provisions for technical assistance. Haney and Kangas define assessment and evaluation, and explain 10 steps they use in this process.

Edythe Finkley, evaluation team leader with the Communication Systems Evaluation Center (CSEC) in Orlando, provides a brief description of their program and explains the process used for evaluation at CSEC. She describes how data collected from screening, preevaluations and on-site evaluations are used to make decisions about individuals and their needs, and concludes by summarizing the strengths and weaknesses of the CSEC model.

The final chapter, by Faith Carlson of the Pittsburgh Augmentative Communication Cooperative Project, describes the four major components of their evaluation process as screening, diagnosis, evaluation and assessment. Carlson stresses the need to evaluate the environment where the individual will use the system. She provides several basic suggestions that schools may follow to provide services, when students needing augmentative communication systems have been identified.

CHAPTER 1

COMMUNICATION OPTIONS FOR PERSONS WHO CANNOT SPEAK: ASSESSMENT AND EVALUATION

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OVERVIEW

There are an estimated 1.25 million persons in the United States who are unable to speak well enough to meet their daily communication needs (ASHA, 1981). Severe communication disorders occur as a consequence of a wide variety of developmental and acquired conditions. For some severely communicatively impaired individuals, interventions can be instituted to develop or restore natural communication modes such as speech, writing, and gestures. For others, however, alternative or augmentative communication systems may be required to meet almost all communication needs, from the most routine to the most specialized. Most augmentative system users, like most people who use natural communication systems, do not use one technique exclusively to meet all communication needs. Rather, such individuals utilize a combination of natural communication and augmentative communication techniques, depending on the environment, listener, nature of the message to be conveyed, and other factors.

Augmentative communication interventions are very complex clinical activities that occur over a long period of time. The expertise of professionals from a number of different disciplines is usually required to deal with the cognitive, sensory, linguistic, motor, and communication factors that impact nearly all intervention decisions. It stands to reason, then, that appropriate augmentative communication interventions must be preceded by sophisticated assessment and evaluation activities.

This paper will describe a number of models commonly used to assess and evaluate persons who are nonspeaking due to chronic conditions such as mental retardation, spinal cord injury, amyotrophic lateral sclerosis, and cerebral palsy. The models will be discussed in terms of five primary goals or purposes of augmentative communication assessment. These goals are as follows:

1. to determine the need for augmentative communication assistance;
2. to determine candidacy for augmentative communication interventions;
3. to select appropriate augmentative communication techniques;
4. to plan and implement appropriate intervention programs; and
5. to document intervention effectiveness or the lack thereof.

In addition, the distinctive characteristics of communication assessment and evaluation with nonspeaking persons will be reviewed, and barriers to effective intervention will be described.

WHAT MODELS ARE USED TO GUIDE THE EVALUATION PROCESS?

The nonspeaking population is very diverse in terms of age, etiology, and lifestyle. Consequently, individuals who are unable to speak have been served by professionals from diverse backgrounds, and the models that have been used to guide evaluation tend to reflect this diversity. At times, these models have been viewed as mutually exclusive or even contradictory. However, in the discussion that follows we intend to describe them in the context of the Model of Disorder described by Wood (1980) and Nagi (1977) and summarized by Frey (1984) in order to show how they interact. According to the Model of Disorder, the consequences of a chronic injury, disease, or syndrome can be conceptualized and divided into three areas of disorder -- impairment, disability, and handicap.

Model of Disorder

According to this model, ***impairment*** refers to "any loss or abnormality of psychological, physiological, or anatomical structure or function" (Wood, 1980, p.4). For an individual who is unable to speak, impairment may be reflected in the loss or abnormal function of the structures responsible for speech, language, and/or cognition. Concomitant impairments may also limit augmentative communication solutions. Consider a child with severe cerebral palsy, for whom speech is impossible due to severely impaired motor control. Careful evaluation of such a child may reveal that not only is speech impaired but that the motor involvement also affects posture and limb control, which in turn limits the types of augmentative communication techniques the child is able to use. For most nonspeaking persons, assessment of the communication impairment usually involves the measurement of an individual's capability in terms of cognition, language, motor control, and sensory (vision and hearing) abilities as well.

The Model of Disorder describes ***disability*** as that aspect of a disorder that is related to the reduced ability of an individual to meet the needs of daily living. For a person who is nonspeaking, the extent of disability is dependent on many factors, including the severity of the basic impairment, the lifestyle of the individual, and the extent of compensation for the impairment through self-learning, specialized instruction, or prosthetic intervention. Alterations of an individual's communication lifestyle such as might be involved when the person changes jobs, begins school, or retires also have an important influence on disability level, even though the basic impairment may not change (Beukelman, 1986).

Handicap refers to the societal disadvantage that results from either impairment or disability. The extent of a communication handicap depends on both the type of disability and the attitudes and biases of those who are in contact with the nonspeaking individual. For example, if a listener will not take the time to interact with an individual who is using an augmentative communication technique, the skill of the disabled individual or the appropriateness of the augmentative communication technique will have little positive influence on the quality or extent of communication interaction.

Models Used in Augmentative Communication Evaluations

A review of the augmentative communication literature reveals that three general models have been used to guide the evaluation process for individuals who are nonspeaking. In this section of the paper, these models will be reviewed and an attempt will be made to relate them to the Model of Disorder described above.

The ***Communication Processes Model*** has been utilized extensively in the augmentative field and was borrowed from the broad field of communication disorders. This model has many variations and is quite complex; therefore, the discussion that follows should be recognized as a simplified

version of the model. Table 1 is designed to illustrate some of the basic elements of this model as it has been discussed by Chapman and Miller (1980), Nelson (1985), Nelson, Silbar, and Lockwood (1981), and Shane and Bashir (1980).

Table 1*
Summary of Selected Communication Processes Models

	Chapman & Miller (1980)	Shane & Bashir (1980)	Nelson (1985)
Criteria Used to Determine Need, Candidacy and Intervention Focus			
Age	Considered	Used	Considered
Status of speech producation mechanism	Considered	*Decision point*	
Etiology of language production problem		Used	
Past performance in speech production training	Considered	*Decision point*	*Decision point*
Degree of language development:			
Comprehension	*Decision point*	Used	*Decision point*
Production	*Decision point*	*Decision point*	*Decision point*
Level of cognitive development	*Decision point*	*Decision point*	
Degree of pragmatic development	*Decision point*	Used	Considered
Evidence of emotional problems		Used	
Level of environmental support		*Decision point*	
Level of social and play interaction			*Decision point*
Intervention Decisions			
Aided vs. unaided systems			Considered
Type of system			Considered
Symbol system			Guidelines provided

Key: Considered = implicit in the model
Used = explicit in the model but not directly related to a decision point
Decision point = explicit and used to make a decision

* Modelled after Reichle and Karlan, 1985 (Table 1)

The Communication Processes Model is primarily related to the ***impairment*** aspect of the Model of Disorder, as both are concerned with the detection and description of cognitive, linguistic, motor, and sensory dysfunctions. For many years, the Communication Processes Model focused almost exclusively on the linguistic and motor speech aspects of communication. Recently, the need to consider communication use issues has encouraged development of the model to include pragmatic communication factors.

In its most basic application, the Communication Processes Model guides the examiner to ask a series of questions regarding the person with a communicative disorder. These questions are summarized below.

1. Is there a gap between the communication performance of the nonspeaking individual and that expected of an unimpaired individual? An assessment is completed to determine if an individual's communication performance profile is within normal limits. If no discrepancies are identified, intervention is determined to be unnecessary. However, if discrepancies are present, an attempt is usually made to describe the person's communication abilities with respect to various communication processes. The exact nature of the resulting profile will reflect the orientation of the specific model used. In some cases, the profile may be related to the classic linguistics model, in which the semantic, syntactic, and phonological capabilities of the individual are described and compared to expected performance based on normative information. In other cases, the profile may attempt to document the content, form, and use patterns of communication in accordance with a more functional or pragmatic orientation (e.g., Nelson, 1985).

2. Does the nonspeaking individual possess the prerequisite skills considered to be basic to communication? Some of the most commonly assessed prerequisite skills are those related to cognition, under the assumption that the individual's cognitive level is a valid predictor of the expected limits of his or her communication performance. If there is a substantial gap between cognitive level and communication performance, an intervention program specifically designed to improve communication performance is implemented, with the goal of reducing or eliminating the cognitive/communication discrepancy. If there is no gap between cognitive level and communication performance, several options may be available, depending on the philosophical orientation of the professional or agency involved. In some cases, the lack of a cognitive/communication performance gap will result in the individual being excluded from communication intervention services and being placed instead in a program designed to increase general overall ability. In other cases, an individual who demonstrates no cognitive/performance gap might be included in a language or communication intervention program with the goal of improving cognitive abilities through a variety of communication-related activities.

3. Does the individual's speech production mechanism function well enough to permit a favorable prognosis with regard to verbal output? If speech mechanism control appears adequate, intervention aimed at improving speech motor control is not included in the overall communication program. However, if motor control problems are present, an intervention program is designed to improve the adequacy of natural speech or to provide adaptive assistance to allow verbal expression at a level consistent with the person's cognitive and linguistic capabilities. Different versions of the Communication Process model assign different priorities to this issue, but all address it in some way (see Table 1).

4. What are the patterns of communication use? During recent years, the Communication Processes Model has been expanded to include consideration of communicative use patterns in making augmentative communication decisions (see Nelson, 1985).

How well does the Communication Processes Model meet the goals of augmentative communication assessment?

The success or failure of any assessment model can be evaluated in terms of the extent to which it is able to accomplish the assessment goals. In this section, the five primary purposes of augmentative communication assessment described previously will be discussed as they relate to the Communication Processes Model.

Goal 1: To identify the need for augmentative communication assistance

The Communication Processes Model identifies individuals whose communication performances differ from the norm. As such, the model serves an important function in the assessment of children with communication problems; however, it is less applicable in the assessment of older nonspeaking persons, for whom comparisons to normal performance are less relevant. While the communication needs of nonspeaking children participating in educational programs may be quite similar to those of their speaking peers, the communication needs of adults vary considerably, depending on a number of factors. For example, an individual whose job requires minimum interpersonal interaction may be only slightly inconvenienced by a major communication impairment; whereas a lawyer, teacher, or pastor, whose job requires extensive communication may be disabled by a minimal communication impairment. For older individuals, the type and extent of ongoing communication needs become important factors in determining whether or not an augmentative communication intervention is necessary.

Goal 2: To determine candidacy for augmentative communication interventions

The Communication Processes Model has been used extensively to determine candidacy for intervention, and is generally useful in this regard. Clearly, the Shane and Bashir (1980), the Nelson (1985), and the Miller and Chapman (1980) efforts provide some decision-making guidance in this area. However, there is a great deal of controversy regarding the appropriateness of the candidacy guidelines for individuals who are severely intellectually disabled, such as those with mental retardation or autism (Reichle & Karlan, 1985). One implication of the model is that persons with cognitive limitations are not considered to be candidates for augmentative communication intervention unless their cognitive performances are at a certain level of proficiency. This unfortunate application of the model seems to be at least partially related to a narrow definition of "augmentative communication intervention" that equates such interventions with the ability to use symbols (pictures, written words, etc.) to communicate.

Goal 3: To select appropriate augmentative communication techniques

Most versions of the Communication Processes Model provides little systematic guidance in this area beyond a description of general capabilities related to communication output. Once decisions related to a need for assistance and to candidacy have been made, other models must be used to guide the decision-making process regarding augmentative system selection. The exception is the Michigan model (Nelson, 1985), which provides some general guidelines related to selection of augmentative techniques and symbol systems.

Goal 4: To plan and implement appropriate intervention programs

Because the model does not identify the specific communication needs of an individual client, provision of communication intervention is not addressed except in terms of which areas (motor speech training, training in augmentative modes, etc.) should be emphasized. Generally, intervention plans based on this model focus on the reduction of the impairment aspects of the communication disorder and may minimize the use and integration of the communication system in activities of daily living.

Goal 5: To document intervention effectiveness or the lack thereof

Because the Communication Processes Model is primarily concerned with issues related to identification of a need for services and determination of candidacy, it does not encourage broad assessment of communication intervention effectiveness. This shortcoming is perhaps best illustrated by the current situation in the field of aphasia, in which intervention efficacy is typically evaluated in terms of whether or not the client's communication processes improve during therapy sessions, rather than whether or not the client is more able to meet daily communication needs in a variety of settings. Such narrow evaluation of intervention effectiveness is problematic in light of Frey's (1984) suggestion that the primary actions required to manage an impairment should be related either to prevention or to increasing the natural skill base so that the impact of the impairment is reduced or eliminated. The Communication Processes Model falls short of this goal in that it fails to provide strategies to measure the impact of intervention outside of the clinical setting.

The ***Communication Needs Model*** has been used extensively to provide augmentative communication services to adults who are unable to speak and/or write through natural means (Beukelman, Yorkston, & Dowden, 1985). The primary focus of this model is quite different from that of the Communication Processes Model. The Communication Needs Model is based on the communication lifestyle of the individual and on a determination of the adequacy with which communication needs are being met. Thus, the model focuses strongly on the ***disability*** aspect of the Model of Disorder. According to Frey (1984), the primary action directed toward reducing the disability experienced by a individual is to intervene or rehabilitate the individual directly. For the nonspeaking individual, this many take the form of many different types of interventions, including augmentative approaches, compensatory approaches, and, in some cases, interventions designed to increase the natural skill base.

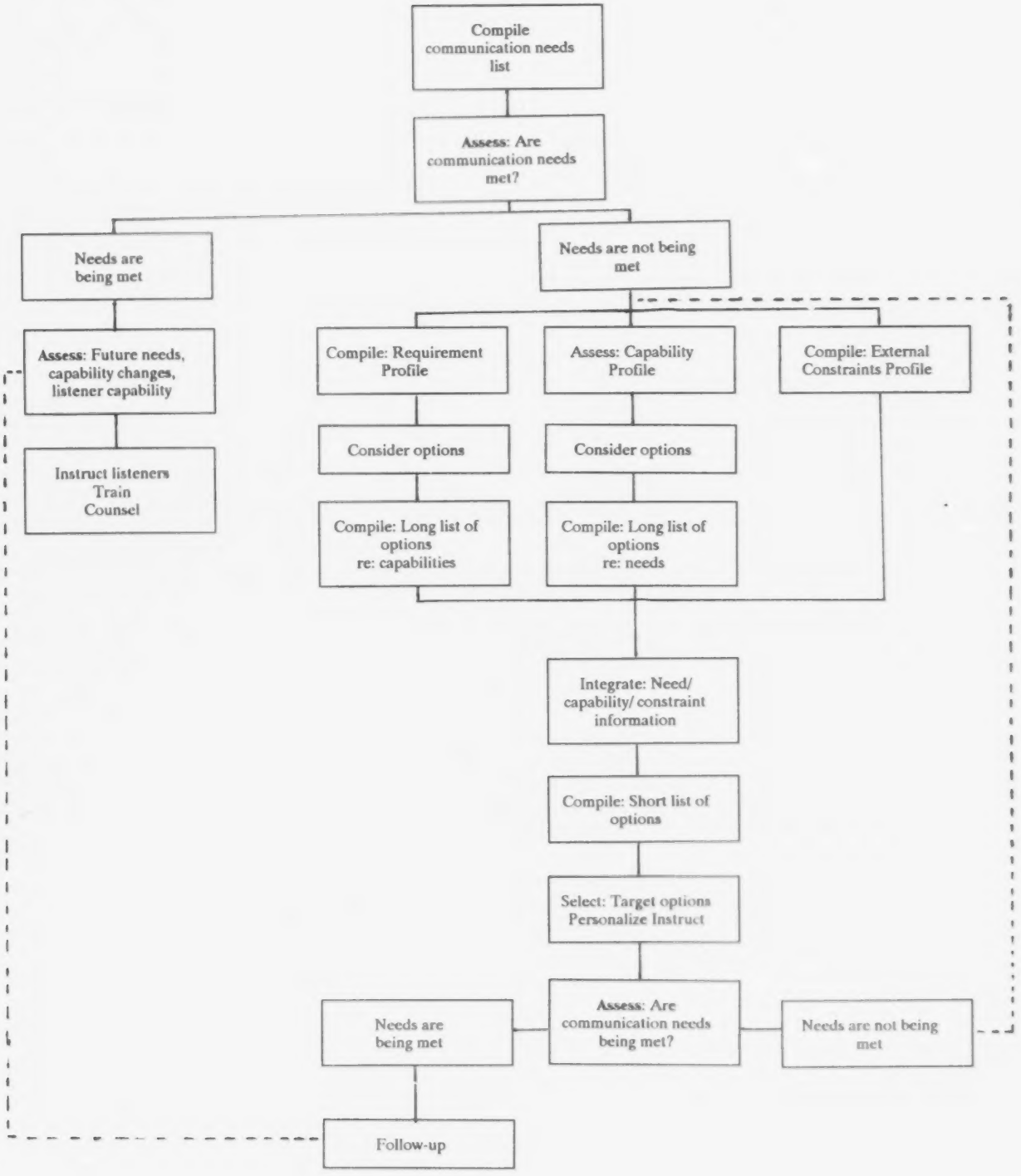
Like the other models, this model has evolved in recent years and takes many forms. The model that will be discussed in this paper is presented in Figure 1. As can be seen from the diagram, three parallel lines of questioning converge to arrive at an intervention decision. The three assessment strands are summarized in the following sections.

1. What are the person's communication needs?

The needs assessment strand identifies the communication tasks that the individual must perform to function in a variety of environments. The nonspeaking individual's ability to meet these communication needs using his current communication system is then determined. If the needs are all being met, intervention is deemed unnecessary unless a dramatic change in communication need is predicted for the near future; examples of such a change include those that might result from a new school placement or a new job. In addition, an augmentative intervention would be instituted with an individual who has no currently unmet communication needs but for whom a decrease in natural communication ability can be predicted as the result of a degenerative condition such as amyotrophic lateral sclerosis. In this case, intervention would begin early to give the

Figure 1

Communication Needs Model



individual ample time to learn to operate an augmentative communication system prior to the onset of speechlessness.

2. What are the person's capabilities?

If the assessment reveals that important communication needs exist or will exist in the future, the focus of evaluation shifts to the capabilities assessment strand. Generally, questions are asked and assessment procedures implemented to gather information related to the individual's cognitive, language, motor control, and sensory capabilities.

3. What constraints exist that may impact intervention decisions?

A thorough examination of external constraints is critical in order to meet the individual's communication needs in a realistic manner. For example, some nonspeaking persons have no communication partners who are capable of using or interested in learning about highly technical communication equipment. Other constraints may be related to the availability of transportation, funding, or adequate follow-up services.

Once information related to the three assessment strands is available, the intervention team can proceed to identify augmentative communication techniques that might be appropriate. Particular care is taken to identify a technique that will maximally meet the communication needs identified during assessment, that can be operated by the individual, and that is permitted within the constraints of the nonspeaking person's lifespace. Personalization and training in the operation of the selected communication technique is usually required. The final phase of the intervention involves follow-up procedures to monitor system use as well as to detect changing needs, capabilities, and constraints.

How well does the Communication Needs Model meet the goals of augmentative communication assessment?

Again, the model will be analyzed in terms of the five basic assessment goals identified previously.

Goal 1: To identify the need for augmentative communication assistance

This area is one of the primary strengths of the Communication Needs Model, particularly as it is used with adult clients. Assessment based on the model begins with a thorough description of the individual's communication needs based on both current and projected lifestyles. If the individual's current and predicted communication needs are met using the current communication system, intervention is not warranted. If the person's current communication system is inadequate in terms of the communication needs, intervention is considered.

Goal 2: To determine candidacy for augmentative communication interventions

The capability assessment aspect of this model focuses on the candidacy issue as well as the selection of augmentative communication alternatives. However, unlike the Communication Processes Model, the Needs Model is based on the assumption that if a need exists, the individual is probably a candidate for some some type of intervention. Less emphasis is placed on determining whether a cognitive/communication gap exists or whether the individual has mastered a set of communication prerequisites.

Goal 3: To select appropriate augmentative communication techniques

The Communication Needs Model does an effective job of guiding decisions about the selection of augmentative communication techniques. The capability assessment strand provides extensive guidance in all aspects of this decision-making process.

Goal 4: To plan and implement appropriate intervention programs

Although this model is useful for selecting augmentative communication alternatives, it is weak in focusing the intervention team on the specific communication processes that must receive attention.

Goal 5: To document intervention effectiveness or the lack thereof

This model has been used in a limited way to measure the effectiveness of intervention. Dowden, Beukelman, and Lossing (1986) utilized the Communication Needs Model as the basis for a service delivery program to nonspeaking persons in intensive and acute medical care facilities. Intervention efficacy was determined by calculating the percentage of communication needs met by the preintervention and the augmentative communication approaches. One of the factors that allowed this model to be used successfully in the intensive care setting was that the high degree of physical and environmental control inherent in such a setting permitted careful documentation of communication need. Obviously, the utility of the Communication Needs Model to measure intervention effectiveness will be limited by the accuracy of the initial communication needs assessment.

Recently, the ***Participation Model*** of assessment (Rosenburg, 1987) has been introduced in an attempt to focus educational and other programs on the need for critically evaluating communication interventions in terms of their societal impact (Fig. 2). The model has two major strands: that related to communication access and that related to communication opportunity. The Participation Model is actually an extension of the Communication Needs Model, in that the latter deals with most of the issues in the access strand.

Figure 2: Basic Elements of the Participation Model (Rosenberg & Beukelman, 1987)

The opportunity strand of the Participation Model deals with issues that are included in the ***handicap*** portion of the Model of Disorder, since opportunity factors are largely under the control of society. According to Frey (1984), the primary means for solving problems related to a handicap are legislation and education. These terms must be interpreted in terms of the size and nature of the society in question. For example, in the classroom "society," "legislation" refers to the rules of conduct or procedures that are determined by the teacher or building principal. The personnel involved in making school rules may require "education" aimed at helping them modify the rules so that communicatively disabled students have opportunities to participate in a normative fashion. Similarly, a number of changes in the "rules" of interaction have been found to be very useful in providing nonspeaking children with augmentative systems the opportunity to participate in the communicative interactions of the family "society". Such rules include 1) ask one question at a time; 2) pause for at least five seconds after asking a question so the child has the time to respond; and so forth. Like the ***handicap*** portion of the Model of Disorder, the Participation Model focuses on minimizing societal barriers to communication and maximizing opportunities for normalized involvement. This model is illustrated in Figure 3, which presents a simplified version of the assessment/intervention processes involved.

Briefly, the ability of a person to participate is assessed based on two factors -- access and opportunity. In this model, access can be illustrated in several ways. For example, mobility access allows the individual to gain proximity to an activity by virtue of independent control of a wheelchair as well as the presence of adaptations such as the curb cuts and wide doors that are necessary in order for him or her to move about freely. In terms of communication, access is achieved when a nonspeaking individual is given the techniques to communicate messages in an independent manner to appropriate listeners.

However, access alone does not ensure participation. Disordered individuals must also be given adequate opportunities to participate. Consider, for instance, a physically disabled college student who has mobility to access a classroom and has an augmentative communication system that allows spoken and written communication, but is faced with a department admissions committee that discourages him or her from applying for a degree in the department. The college student certainly has access to communication, but is denied an appropriate communicative opportunity. Another example might be that of a kindergarten child who is independently mobile in a power wheelchair and has a communication system, but is unable to participate in a group activity because the opportunity to be properly positioned in the learning area is not provided. The result may be that the student, along with several thousand dollars worth of equipment, sits passively in the back of the room unable to participate.

The phases of assessment in the Participation Model are designed to evaluate both access issues such as need, capability, and constraints; and opportunity issues such as those illustrated above. The model also delineates a decision-making process for determining intervention solutions and evaluating the outcomes as they relate to both access and opportunity.

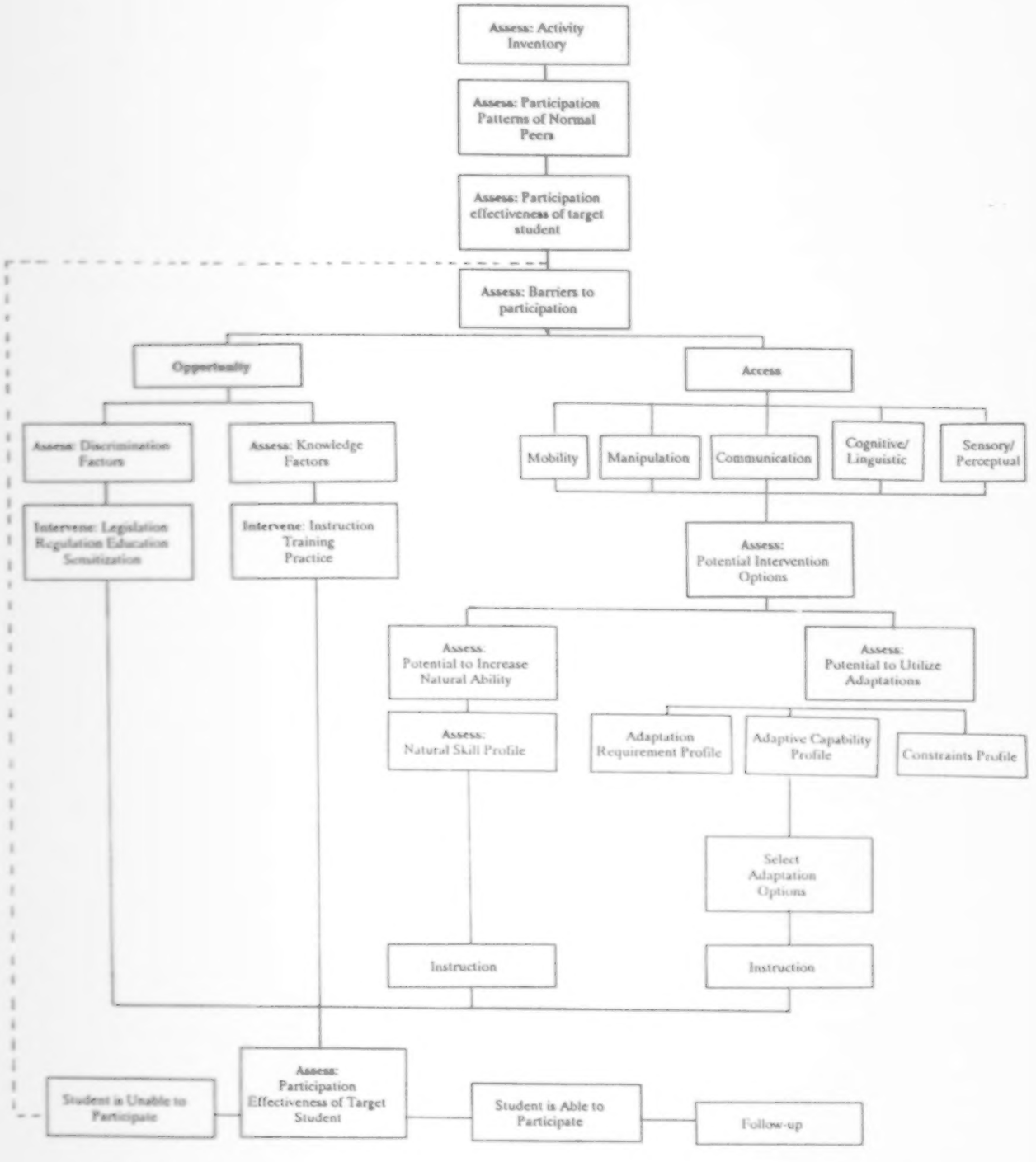
How well does the Participation Model meet the goals of augmentative communication assessment?

Like the other models described previously, the Participation Model has both strengths and weaknesses when used in isolation to make intervention decisions.

Goal 1: To identify the need for augmentative communication assistance

The Participation Model is sensitive to the level of involvement by a nonspeaking person in activities that have been specified as important. Assessment of the level of involvement takes into

Figure 3:
Participation Model



Rosenberg & Beckefman, 1987

consideration both the nonspeaking individual's communication problems per se and the degree to which the communication problems place the individual at risk for social disvalue (Fey, 1986). It also focuses the intervention team on the specific reasons for lack of involvement. If the nonspeaking person is excluded from communication opportunities because of deficiencies in his or her present communication system, an augmentative intervention would be deemed appropriate. If other reasons are identified to account for the lack of involvement (e.g., mobility access problems), attention would be given to finding solutions to these issues as well.

Goal 2: To determine candidacy for augmentative communication interventions

Because the Participation Model utilizes many of the capability and external constraint assessment procedures discussed under the Communication Needs Model, determination of candidacy is based on a similar process and philosophical orientation.

Goal 3: To select appropriate augmentative communication techniques

Again, this process is very similar to that used in the Communication Needs Model discussed previously.

Goal 4: To plan and implement appropriate intervention programs

The Participation Model focuses the attention of the intervention team on both the capability issues that require intervention attention and the opportunities issues necessary for maximum participation. This model does a better job than any of the others in encouraging the intervention team to deal with the "society" surrounding the nonspeaking person, in an effort to improve the effectiveness of communication interaction and performance.

Goal 5: To document intervention effectiveness or the lack thereof

The Participation Model measures intervention effectiveness by monitoring the level of participation achieved in important activities by a nonspeaking person after the intervention is implemented. The extent of intervention effectiveness can be quantified based on the observed or reported level of participation. This is similar to the "normativist" view of language impairment described by Fey (1986), which considers achievement of educational and social success to be an important measure of intervention effectiveness.

WHAT ARE THE DISTINCTIVE CHARACTERISTICS OF ASSESSMENT OF PERSONS WHO CANNOT SPEAK?

Many of the assessment activities required of professionals in the augmentative communication field are common to those required for the assessment of disabled individuals who are able to speak and/or write through natural means; however, there are some unique issues that require special attention. Regardless of the intervention model employed, these issues must be recognized and accommodated if an assessment program is to be effective.

Personnel

Because of the complex and multidimensional nature of augmentative communication assessment, a transdisciplinary team is required. The composition of the team may vary depending on the client's age, etiology, lifestyle, and degree of impairment. The characteristics of commonly used service delivery models and assessment/intervention teams are discussed in more detail in related literature.

Multiple Environments

Because the communication needs of an individual change in accordance with the communication context, it is mandatory that augmentative communication assessments be at least partially conducted in the primary environments in which the client must communicate. It is common for a communication technique to be effective in one environment such as the client's home, where trained, committed listeners are available; and to be ineffective in another environment such as a classroom, in which numerous, often untrained listeners may be present. Adequate augmentative solutions are usually impossible without assessment in multiple environments.

Intervention Sequence

Ongoing Assessment

As was mentioned previously, the conditions and syndromes that cause severe communication impairment are usually chronic. Therefore, augmentative communication systems are usually required on a long-term basis. As time passes, the communication needs of an individual change, as does the capability level. For some, capability will improve with instruction and time. However, for individuals with degenerative diseases, a reduction in capability and a restriction of communication needs may occur as the impairment increases. An assessment model must accommodate and support the long-term and ongoing requirements of severe communication disorder. In order to accommodate the long-term service delivery requirements of nonspeaking persons, assessment resources must be located within easy travelling distance and must provide a systematic mechanism for regular consultation and input.

Follow-Up

Some augmentative communication interventions involve highly technical equipment that requires ongoing maintenance and repair. In some cases, the local support system surrounding the severely communicatively involved individual can manage these functions. However, these responsibilities are often referred back to the service delivery team, which must have the capability of providing ongoing technical assistance, at least through an efficient referral process.

Critical Decision-Making Points

The sequencing of assessment is often guided by some specific decision-making points. Careful attention to these points will allow a team to efficiently schedule clients for ongoing evaluation and follow-up services. Yorkston and Karlan (1986) have suggested that augmentative assessments or reevaluations are particularly critical at points such as 1) when an individual experiences ongoing frustration in attempting to communicate specific messages; 2) when a child prepares to enter a preschool program or, later on, when a change in educational placement has occurred or is contemplated; 3) when graduation from high school is anticipated, whether the individual plans to enter the world of work or plans to continue education at a college or university; 4) prior to graduation from a post-secondary institution; 5) prior to resumption of work for an individual whose communication problems are the result of a late-onset impairment such as a spinal cord injury; and 6) prior to the loss of speech that usually occurs with degenerative diseases such as amyotrophic lateral sclerosis, multiple sclerosis, and so forth. At points such as these, the transdisciplinary team should be involved in order to enable the individual to successfully communicate at the maximum level possible.

WHAT BARRIERS LIMIT EFFECTIVE COMMUNICATION ASSESSMENT IN 1987?

Regardless of the model employed to assess nonspeaking persons, certain barriers and constraints exist that interfere with effective, efficient assessment and intervention.

Evaluation Tools

Although the models described previously suggest that various assessment tools, including communication need questionnaires, motor capability instruments, and intervention effectiveness measures be used, few such tools are commercially available. The tools that are available are, for the most part, psychometrically underdeveloped. There is little information about the accuracy of augmentative communication predictions made by use of the available tools, since most were developed for other purposes and have been borrowed for use in augmentative evaluations. There is a critical need for a wide variety of reliable, valid assessment instruments that include standardized administration procedures.

Limited Trained Personnel

The population of professionals who are knowledgeable in the augmentative communication field is extremely small. Of course, properly training personnel are basic to effective assessment and intervention. Issues related to personnel preparation are discussed in detail elsewhere in these proceedings.

Need for Follow-up Evaluation

Because the inability to speak and/or write is usually a condition, the need for long-term follow-up is apparent. However, for a variety of reasons, the vast majority of service delivery centers in the United States that engage in augmentative communication assessment activities currently provide minimal follow-up services. Some of the reasons for this include 1) lack of available funding for follow-up assessments; 2) extremely long waiting lists for initial evaluations and a related non-availability of personnel for follow-up activities; 3) lack of sufficient time for follow-up; and 4) failure of the assessment models in widespread use to encourage follow-up activities, primarily because the models were not originally intended for use with chronic disorders. As the augmentative communication field continues to grow and expand, provisions must be made to address the need for follow-up services in an systematic and efficient manner.

SUMMARY

Clearly, the assessment and evaluation of persons who are nonspeaking is a complex and difficult task, requiring the cooperative efforts of a variety of professionals as well as coordinated, systematic planning. Several assessment models have been used in this regard, and each offers a unique perspective to the overall evaluation process. As the young field of augmentative communication continues to grow and develop, efforts must be made to describe the assessment process in precise and measurable ways, and to institute procedures for evaluation and follow-up across the age range.

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CHAPTER 2

ASSESSMENT AND EVALUATION: MATCHING STUDENTS AND SYSTEMS

PRESENTERS: Joan Bruno, M.S. CCC-SP
Barry Romich, P.E.

INTRODUCTION

Augmentative and alternative communication systems are available today to address the needs of students who cannot effectively express themselves and are often excluded from the educational process. This paper reviews issues relating to the assessment and evaluation of the students and the selection and implementation of possible solutions.

ASSESSMENT AND EVALUATION OF STUDENT CAPABILITIES AND NEEDS

Several authors (Shane & Bashir, 1980; Owens & House, 1984) have described factors which help clarify when an augmentative communication evaluation is indicated. Critical factors in assessing the child's readiness for an evaluation should include cognitive-language abilities at least at an 18-month level; severe oral-motor difficulties which interfere with the development of functional oral communication; a discrepancy between receptive and expressive language skills; and demonstration of the social/communicative correlates which are necessary for functional communication. Social/communicative correlates normally include eye contact, auditory attending, and turn-taking skills.

When a child is observed to demonstrate the above characteristics and in addition has a supportive home and educational environment, the child can then be considered an appropriate candidate for an evaluation. Prior to initiating the evaluation process, it is important to define the purpose or goal of the evaluation. In general, the evaluation goal should be to determine how a technical aid will enable the child to actively participate in learning opportunities and clarify what options are available to enable the child to make choices, to communicate needs, wants, emotions, ideas, and to ask questions. Specific evaluation goals can range from determining the child's readiness to use a device, to selecting a device, or to determining how a given device will be integrated into the child's educational program. Evaluation goals are highly dependent on the child's age and abilities, both physical and cognitive. In addition, goals are influenced by the child's educational environment and academic level. Within the educational environment, regardless of the child's academic level, the evaluation process should provide insight on whether, and how, a technological system could assist the child in reaching his/her potential.

Whether the goal is determining readiness for a system, system selection, or determining how a device could be integrated into the child's curriculum, the evaluation process should address five key areas: 1) present communication skills, 2) cognitive-language abilities, 3) physical abilities, 4) environmental factors, and 5) system considerations (Bruno, 1982; Coleman et al., 1980; Yorkston & Karlan, 1986). There are various models of how the evaluation process can be accomplished. Regardless of the model used, the evaluation process requires a multidisciplinary ap-

proach. The key individuals for providing input into the evaluation process include the speech-language pathologist, the classroom teacher, a physical and/or occupational therapist, the parent, and, depending on age and cognitive abilities, the child. Ancillary staff may include social workers, psychologists, carpenters and an engineer. Each of these individuals is able to provide key information which will lead to answering the specific questions raised at the onset of the evaluation.

Evaluations can be accomplished through various models of service delivery. These models include the medical model, the educational model, and the consultant model. The consultant model was adopted by the Prentke Romich Company. In this model, the consultant is either a speech-language pathologist or special education teacher with a strong background in both child development and the field of augmentative and alternative communication. The consultant helps coordinate the evaluation process with the referring agency. The consultant works with members of the child's educational team eliciting the information needed to arrive at a solution which appropriately addresses the purpose of the evaluation. Details of the consultant model will be discussed in greater detail in a following section.

In addition to variations in the format of an evaluation being related to the particular model used, variations are also a result of the differences in student user populations. Each user population brings different capabilities and needs to the evaluation process. Students can be broadly divided into three categories: 1) preschool, 2) school-age special class, and 3) school-age regular class. The school-age special class category can be subdivided into cognitively impaired and cognitively intact. There are major issues within each population that contribute to slight yet significant variations in the evaluation format.

For example, with preschool children there is often ambiguity about the child's present abilities, and even more ambiguity about the child's potential for academic success. The young child is in a state of rapid development, so changes in the child's performance may be more frequent. Parents may be unrealistic in their expectations for the child's future, or unwilling to accept the need for a technical aid. As a result of these factors, the evaluation of a preschool child may best be accomplished by those who know the child well, with the assistance of an outside consultant if needed. Based on the child's developmental changes and level of maturity, the evaluation may need to be accomplished over a period of time, rather than during the discrete session.

The cognitively intact child in a special class is often severely physically impaired. Integration into regular class may not have been in the child's best interest. Educational activities may be highly academic in nature and include the traditional subjects of reading, writing, math, social studies, science and the like. Participation in these academic activities may often require interfacing the child with a broader range of technical aids. This child frequently receives multiple therapy services as a part of the educational program. Therefore, it is more likely that many of the child's physical needs, in terms of positioning and access, are being addressed within the school environment. Depending on the range of services offered and their level of sophistication, an evaluation may be accomplished independently by the school staff, with the assistance of a consultant, or by referral to an outside agency.

The educational objectives for a cognitively impaired child are often quite different from those for a cognitively intact child. In contrast to a class for the cognitively intact child, a classroom for the cognitively impaired child will focus on life skills or vocational activities. The range of physical abilities varies, however, these classes are frequently staffed with rehabilitation therapists, at least on a consultant level. Within the state of New Jersey, the greater the degree of the cognitive impairment, the more focal the role of the classroom teacher, in comparison to the therapy consul-

tants. This may not be consistent from state to state. Evaluation options are the same as for the cognitively intact child in a special class.

The physically impaired child in a regular class usually has good cognitive abilities and may exhibit any range of physical problems. The physically disabled child will work on standard academic tasks, although they may be modified somewhat to meet the child's individual needs. Appropriate use of technology to facilitate the child's educational success is often a key issue with parents. It may be less critical to the teachers and other staff. In this environment, if the utilization of a technical aid will place greater demands on the teacher's time, it is often resisted. Resistance also results from their limited experience with the devices. In a regular school, there are usually fewer professionals available to handle the child's physical needs. A successful evaluation for a child in this setting usually requires assistance from outside resources.

Different student user populations demonstrate different abilities and needs. Any evaluation must take these needs into consideration if the outcome is to be an effective solution to the problem. In addition, it is important that the evaluation take into consideration specific issues related to the device.

ASSESSMENT AND EVALUATION OF DEVICE CHARACTERISTICS

The ultimate task confronting the augmentative and alternative communication (AAC) clinical team is the selection and implementation of an AAC system that offers the client the greatest potential for high personal achievement. In order to carry out this task, it is necessary to objectively evaluate the characteristics of the various solutions. Although nontechnical solutions are available, the authors feel that for most clients the highest personal achievement will result from the selection and application of an electronic communication device. Therefore, this paper addresses only that approach. Selection criteria beyond device characteristics are covered in a following section.

Device characteristics that must be evaluated are presented here in priority order:

- Vocabulary Organization System
- Application Software
- Hardware
- Peripherals

Beyond vocabulary selection, the most important issue in augmentative communication intervention is organizing the vocabulary in a manner that makes it truly useful to the person using the system (Crystal, 1986). This issue is far more important than any other device characteristic (Romich, 1987). Over the course of the development of the field of AAC, many vocabulary organization systems have been put into practice. These include levels and locations, pages, number codes, letter codes and abbreviations. Each, in turn, has shown itself to be limiting to at least some portion of clients. These limitations have been largely a result of increasingly realistic estimates of the size of a usable personal vocabulary. It has recently been suggested that semantic vocabulary organization is the only approach that makes any sense at all (Crystal, 1986). While low-level clients may never develop a vocabulary of a magnitude to make full use of semantic organization, a prejudgment on this point could be the equivalent of a life sentence to low achievement. One after another, clients are showing us that, given the opportunity, achievement is possible.

Application software is the newest device-related issue in the field of AAC. The effective implementation of an AAC system for a client is not a trivial undertaking. Few practicing speech-lan-

guage pathologists (SLPs) today have had any formal education in AAC, even those who graduate from master's programs this year. Most SLPs have no idea where to begin when first encountering an AAC client. Few clinic experts exist. And even for the expert the process of setting up a system is long and arduous. Device manufacturers are recognizing this and have begun to take action to address the problem. Application software is becoming available for specific population categories. The software can include a coded starter vocabulary and a symbol set, both with expansion guidelines. This area is now an important consideration in the selection of an AAC system.

Until recently, hardware was the primary consideration in the selection of an AAC system. The two main hardware areas are selection technique and output. Certainly, a device is useless if the client cannot physically operate it. Many selection techniques are available today to match the physical abilities of various clients. Standards have been developed to permit generic control interfaces to be used with different devices. Therefore, compliance with those standards should be checked.

Possible outputs include synthetic speech, a correctable display, a printer (or connection for one), a computer connection and infrared telemetry. Each output can be evaluated separately. Peripheral items include such things as control interfaces, wheelchair mounting systems, computer keyboard emulating interfaces, environmental controls and data telemetry systems. The process of evaluating devices is not easy. However, this framework can add some objectivity to the process. Gathering the needed information may require contacting the device manufacturers or their local representatives. Since this field is changing rapidly it is important to be using current information.

MATCHING DEVICES TO STUDENTS

Device selection is the final step of the evaluation process. As mentioned above, the device selected should promote the highest possible level of personal achievement. Appropriate selection requires a knowledge of user abilities and needs, device options, educational goals and developmental expectations. The physical, cognitive, language and educational abilities of the child must be met with the selection technique and vocabulary organizational system of the device. The device should maximize, but not exceed, the child's ability. In addition, the output(s) of the device must be matched to the needs of the child. In the educational environment, needs are not limited to education, but can include computer access, mobility and environmental control.

Each student-user population brings different issues to the matching process. Children in a preschool setting typically do not require a system with a display or a printout. However, voice output is usually a high priority. Young children have a need for larger stimulus materials. In addition, they encounter difficulty with visual scanning tasks. As a result, constraints are placed on the device options available to this population.

Cognitively intact children working on an academic track require numerous considerations when selecting the appropriate system. The device should provide a correctable visual display, hardcopy output, as well as voice. These children need both a written and spoken means of interacting in the classroom. They need access to numbers, the alphabet and punctuation. In addition they need to rapidly generate large amounts of information. To accommodate the changing material presented within their curriculum, devices need to be user programmable. Programming should be easy and not require an enormous amount of staff time.

Attempting to match a device to a cognitively impaired child may require some of the same system considerations as the matching process for both the preschool child and the cognitively intact

child. The device may not need to have features which provide hard-copy output or visual display. It may need to be simple in terms of how the child is to access information stored within the system. The features that the device must have will be determined by the child's abilities as well as the child's educational goals.

Factors besides the child's needs and abilities must be considered when selecting a device. Technical and applications support are major considerations. The availability of newsletters, educational programs, conferences and similar activities should influence the device selection. The procurement of funding for the device is often an issue, but should not influence the selection of the device. Availability of the product may be an issue in situations of rapid client deterioration, but this is more commonly encountered in adult clients than in the educational setting. Selecting a device with a broad base of application experience can be an asset. To effectively use the device in the educational environment, educational personnel must be comfortable with its operation. The likelihood of this evolving increases when the device selected is a commercially available product and not a one-of-a-kind system.

THE CONSULTANT MODEL

As described above, the consultant model adopted by the Prentke Romich Company (PRC) uses speech-language pathologists or special education teachers who have developed expertise in the area of augmentative and alternative communication to serve as consultants. These consultants provide on-site support to the educational agency where the child is enrolled. As a result, a child can be evaluated in a familiar environment by familiar staff. The consultant interacts with key staff to accumulate and integrate vital information. This process enables all the necessary staff to be available for the evaluation without placing excess demands on the administration. This process eliminates the expense of sending staff to another site for the evaluation and hiring substitutes in their absence. The consultant does not evaluate the child, but rather guides the school staff through the process. The consultant makes recommendations to the team.

Another important aspect of the consultant model is that the consultant brings an array of device options to the educational agency. Recognizing the cost of augmentative communication equipment, it is not always feasible for a school system to have access to the necessary equipment options. Also of significance, school staff frequently do not demonstrate expertise in system operation. With this model, the consultant brings the needed expertise to the process. Each consultant is knowledgeable with system features and system operation.

Performing the evaluation on site offers an additional benefit to school personnel. By being a part of the evaluation process, staff begin to broaden their basic knowledge of equipment options and also of how the equipment works. In addition, a primary role of the consultant is to provide in-service training to staff, as well as advanced workshops on requested topics. This model also provides for training in equipment set-up and basic operation. Recognizing the complexity of current communication systems, the training afforded to users and staff by this model serves as a springboard to successful utilization of the system in the child's educational environment.

The cost of the service provided by the PRC consultant is a function of the level of service. There is presently no charge for time dedicated to assessment activities. Similarly, basic familiarization with the purchased PRC equipment is provided with no time charge. However, actual client intervention and follow-up services are provided on a time available basis at a nominal professional services charge rate. The intention in offering these services is not to compete with existing service providers, but to assure that all PRC device users have available the services of a competent AAC clinician.

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CHAPTER 3

OVERVIEW: EVALUATION/ASSESSMENT DEFINED AND IN RELATION TO P.L. 94-142 AND P.L. 99-457

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> The process of communication is the foundation upon which all educational experience rests and out of which emerges the only known evidence of academic success or failure. Educational input will depend on the child's ability to receive, interpret, store, recall, and express the stimuli provided by his environment. To understand this concept is to recognize that communication skills are basic to all learning and to all living . . . Educational systems have too often failed to stress these fundamental abilities as they have attempted to build superstructures out of the learning of more traditional academic subjects, all of which depend on successful communication. (McWilliams, 1969, p. 149)

In order to plan an effective educational program, there must first be a well-planned, meaningful assessment that results in the collection of a wide range of information about that student. This information should provide the basis for intervention strategies that are a combination of remedial, accommodative, and ameliorative (Gearheart & Willenberg, 1973).

In the American Heritage Dictionary of the English Language (Morris, 1969), both "assess" and "evaluate" are considered synonymous with "estimate" -- to form a tentative opinion about, to make a judgment based on one's impressions. While "estimate" lacks definitiveness, "assess" and "evaluate" imply considered and authoritative judgment and critical analysis. Specialists in the measurement and evaluation of human behavior are asked to estimate children's behavioral capabilities and achievements. Obviously, the accuracy of these estimates is critical, since the data is used to make significant decisions (Smith, 1969).

In this paper, the terms "assessment" and "evaluation" will be used interchangeably for the most part. There are subtle differences which should be kept in mind, however. "Assessment refers to the collection and interpretation of data using standardized and nonstandardized, formal and informal, direct and indirect procedures, techniques, and instruments (Yorkston & Karlan, 1986). This could be considered a part of the overall process of an "evaluation." This information is then used in judging decision alternatives. It is the concept of "judgment" that would separate the two terms. The more important distinction between terms is that between "assessment" and "testing." This distinction must be very clearly recognized. "Testing" refers to the use of a standardized instrument that provides a quantitative characterization (Newland, 1963) using defined procedures in a particular way with particular materials (Yorkston & Karlan, 1986). The concept of "assessment," on the other hand, involves the total view of the individual interacting with his environment. Test results can assign a deceptively precise score to performance on a task, while assessment implies viewing the student's performance with respect to other variables, such as attitude, interests, motivation, perceptual and conceptual performance, acculturation, rapport with others, and the significant social influences. "Assessment is more than simple quantification of an individual's behavior. It does not merely label an individual... but instead attempts to explain why

an individual obtains a certain score... embodies a qualitative characterization." (Smith, 1969, page 13)

The focus on functional descriptions is useful in program planning rather than labels as the outcome of an evaluation is the primary differentiation between an educational and a medical model. Test scores, IQ numbers, and medical or psychological labels have little meaning if they offer no guidance for planning effective instructional procedures.

PL 94-142, the Education of All Handicapped Children Act of 1975, mandated that all students ages 3-21, regardless of handicapping condition, receive a free appropriate public education in the least restrictive academic setting consistent with his needs. Students with severe expressive communication disorders are at great risk of not benefiting from the educational experiences provided. These students are unable to participate in speaking interactions (oral response to questions, reading aloud, asking questions, group participation, requests for clarification, etc.). Writing tasks are also likely to be difficult, and the ability to independently produce written work is known to be vital to successful academic learning. Provision of communication aids can facilitate placement in the least restrictive educational setting for severely communicatively impaired children, ranging from regular classroom environments to increased interaction with peers (able-bodied and handicapped), thus providing a more normalized educational experience (Shane, 1986).

PL 99-457, Education of the Handicapped Act Amendments, signed by President Reagan on October 8, 1986, significantly expands services to infants, toddlers, and preschoolers. It reauthorizes PL 94-142, and now mandates services to children under six. All states are now required to provide special education to children three through five years old, and the Early Intervention for Handicapped Infants initiative of PL 99-457 mandates services for children from birth through two years. States have three years to implement these programs from enactment of the legislation (GAR, August 1986, November 1986). Components of the statewide systems of "coordinated, comprehensive, multidisciplinary, interagency programs..." include procedures for multidisciplinary evaluations of the functioning of handicapped infants and toddlers; a comprehensive system of personnel development; identification and coordination of all available resources within the state from Federal, state, local and private sources; a policy for contracting with service providers; and for receiving reimbursement from responsible agencies. Demonstration grants are authorized which "show promise of promoting a comprehensive and strengthened approach to the special problems of children" (GAR, November 1986). A discretionary program is also created to focus on applied technology (Word from Washington, 1986).

In the educational setting, assessment has as its fundamental purpose the provision of information to be used in individual educational planning (IEP). The IEP, then, becomes the "design for learning" (Gearheart & Willenberg, 1980).

Specific parts of the rules and regulations of PL 94-142 under the section "Protection in Evaluation Procedures" are particularly relevant to the assessment of pupils with severe expressive communication disorders:

> Testing and evaluation materials and procedures used for the purposes of evaluation and placement of handicapped children must be selected and administered so as not to be racially or culturally discriminatory. State and local educational agencies shall ensure, at a minimum, that:
>
> a) Tests and other evaluation materials:

1) are provided and administered in the child's native language or other mode of communication, unless it is clearly not feasible to do so;
2) have been validated for the specific purpose for which they are used; and
3) are administered by trained personnel in conformance with the instructions by their producers...

c) Tests are selected and administered so as to best ensure that when a test is administered to a child with impaired sensory, manual or speaking skills, the test results accurately reflect the child's aptitude or achievement level or whatever other factors the test purports to measure, rather than reflecting the child's impaired sensory, manual, or speaking skills (except where these skills are the factors which the test purports to measure);...

d) The evaluation is made by a multidisciplinary team...

e) The child is assessed in all areas related to the suspected disability, including, where appropriate, health, vision, hearing, social and emotional status, general intelligence, academic performance, communicative status, and motor abilities. (Federal Register, Volume 42, No. 163, Tuesday, August 23, 1977).

The Council for Exceptional Children has provided guidelines related to these regulations which include suggestions to use criterion-referenced instruments and to use developmental checklists where appropriate (Exceptional Children, March 1977). One other aspect of PL 94-142 should be considered as we proceed with a discussion of assessment of severely communicatively impaired individuals. The progression from assessment to IEP continues to the Individual Implementation Plan (IPP). In addition to IIP components such as related services and teaching strategies/modalities, those materials identified by the implementers as essential to the unique learning needs of the child are specified. The IIP then shows the specific educational and related services (human resources) and special materials (material resources) needed by the student in order to achieve the full educational opportunity goal provided for in PL 94-142. With the increase in the quantity and quality of technological tools that can help meet the defined needs of a pupil, these tools should be considered as another contingency in the overall instructional plan (Gearheart & Willenberg, 1980).

ISSUES IN ASSESSMENT OF SEVERE COMMUNICATION DISORDERS AND TECHNOLOGY NEEDS

Yorkston and Karlan (1986) define assessment as it relates to augmentative communication as "a process during which communication problems are identified and described, and a systematic plan for communication intervention is designed or reevaluated" and leading "to the selection of the most appropriate aids, techniques, symbols, and strategies to meet current and future communication needs." The outcome of an assessment should be the design of an intervention program that seeks to reduce current disability (by compensating for present impairments) and to reduce further disability (by improving skills essential for later development of more effective communication).

A child's communication needs must be determined, components of the existing system evaluated, capabilities and skills assessed (cognitive, linguistic, motoric, sensory, perceptual, interactional), resources and constraints of the environment identified, and performance trials provided. This definition is given as a background to those issues that I have identified as critical in moving for-

ward to establish effective assessment/service delivery systems for children with severe expressive communication disorders.

The Nature of the Population and Impact on Assessment Procedures

Bradfield and Heifetz (1976) state that "If ever a population of children were inappropriate for traditional types of measuring instruments common to educational practice, it is the severely and profoundly handicapped... The multiple impairments which characterize profoundly handicapped children make the use of instruments normed on populations without these impairments totally inappropriate. The most valid assessment data are those behavioral data which are obtained through a day-to-day, hour-to-hour, minute-to-minute, continuous monitoring system. The term assessment itself, when applied to the severely and profoundly handicapped, must be synonymous with terms such as teaching, education, and programming." (page 162)

The capabilities (cognitive, motoric, interactive, linguistic, sensory) of clients with severe expressive communication disorders vary widely depending on underlying neuropathology (the primary breakdown) and secondary deficits. Kamhi (1984) discusses the way children react to and compensate for a primary deficit as a determining factor in the nature and extent of secondary deficits. For example, if a child's interactions with the world are kept to a minimum (say, by a physical disability resulting in no clear expressive mode of communication), it is likely that in addition to the primary deficit (inability to communicate effectively), there will be a secondary motivational deficit because the child has become accustomed to a low level of interaction. Thus, any assessment and resulting recommendations must recognize this in program planning. Additionally, the status of sensory and/or behavioral factors and the type and amount of environmental support vary widely. Because of the diverse nature of the individuals who might benefit from augmentative systems, and the intricate cause-effect relationship between the characteristics of each individual and his/her environment, effective assessment is not a one-time event, but an ongoing process. The phases of management (assessment, intervention/diagnostic intervention, measurement of outcome/reevaluation) are closely related.

Another factor contributing to the need for an assessment model that recognizes the ongoing nature of the process is the importance of performance trials. Once components have been selected (devices, techniques, symbols, and strategies) in order to recommend an optimum communication system, they should be evaluated in trial periods of actual use before a final judgment about adequacy of selection is made. This allows time for motor learning to occur, to select additional vocabulary, and to document improvement in communication skills (Yorkston & Karlan, 1986).

The Need for Knowledgeable Professionals

Assessment of severely communicatively handicapped children requires a multidisciplinary assessment team. The core of this team usually consists of a speech-language pathologist, a special educator, an occupational therapist, and the family. Consultative support should be available from an audiologist, a psychologist, a physical therapist, a rehabilitation engineer, and a computer programmer. At the present time, there are not enough professionals with adequate training and/or experience in augmentative communication to meet the potential needs for effective statewide evaluation/recommendation/training/follow-up systems, especially in non-metropolitan areas. Expertise is needed in awareness of available equipment, operation of equipment, techniques for various domains of skill development, functional application of systems in various environments, and so on. As Blackstone (1986, page 6) states in the preface to Augmentative Communication: An Introduction, "To serve the many needs of individuals with severe expressive communication disorders, specialized theoretical and practical preparation in addition to discipline-specific education is required." The Leadership Training in Augmentative Communication

project, carried out at the American Speech-Language-Hearing Association from October 1984 to July 1986, has begun to address this need. Release time and training materials are needed for professionals who are already in the field, as well.

The Need for Material Resources

The need for equipment, the "tools," is basic at all phases of augmentative communication/assistive device management: for initial assessment, for extended performance trials, and for use as the optimal functional tool for the individual. At present, this is one of the major areas of difficulty for those in need of assistive devices. The time between device recommendation and funding, then between funding and purchase, can span many months -- if the device is funded at all. The need to raise money through local service clubs, etc., can lengthen the process even further. This procedure also eliminates the performance trial phase in most cases, so that recommendation of a system must be made without that valuable information. Rental units are available on a limited basis, but for some individuals, pursuing funding for such a trial use is difficult.

In most cases, at this conference, the aids being discussed are portable communication devices for individual use. The use of stationary computers with appropriate and input devices for use in special education classrooms and therapy settings, however, also needs to be considered, because of the flexibility they now offer in providing a wide variety of valuable educational and therapeutic experiences to students.

The Need to Plan for Future Environments

It is important that when evaluating, planning a program, and reevaluating an individual with a severe expressive communication disorder, present and future needs be taken into account: communication needs, educational needs, and vocational needs. A functional system should permit continued development of the individual's educational, sociocommunicative, vocational, cognitive, and/or motor skills. For example, there are children who, by using large (4" x 4") selection areas on a Unicorn keyboard as input to an Apple IIe computer running various programs, have developed academic skills through increased active involvement in the educational process, and have concurrently improved their motor skills to the point where they are now able to use a portable voice output device with 3/4" selection areas.

Contrast the previous example with that of a boy who came for an evaluation at the beginning of his senior year in high school. This young man was provided with a 1:1 aide who completed all his written work at school; his mother did the same at home. His speech was very difficult to understand, but had always been his primary mode of communication, and was intelligible when content was known and thus the possible utterances limited. He maintained a B average, including courses such as accounting, and had hopes of attending college. When the time had come for his DVR pre-evaluation, however, he was told that he would not qualify because he did not have adequate skills. Testing showed that spelling and written language skills were at approximately 4th grade level. At the evaluation, he showed potential to use a headstick and a head-mounted light pointer, but a period of trial use was recommended to allow him to develop/improve the necessary motor skills to use either technique efficiently. If attention had been given to communication needs in future environments at all phases of his education, this young man could have continued on to college. In particular, this example points out the importance of considering written as well as conversational communication needs.

BRIEF OVERVIEW OF SOME CURRENT EVALUATION MODELS AND PROGRAMS

Yorkston and Karlan (1986) describe three levels of involvement. Primary level professionals serve the general case load, and carry out assessments that require observation over time. Secondary level professionals function as local specialists. They would serve as manager for a number of nonspeaking clients and as the consultants for area primary level professionals. Tertiary level professionals are part of a specialized team located at regional centers. They would maintain a comprehensive, up-to-date knowledge of aids, techniques, symbol systems, and strategies. They would be available for comprehensive assessment of complex cases, personnel training, research (e.g., the development of outcome measures, mentioned previously), advocacy, and consultation regarding issues such as funding and intervention programs. Involvement in program implementation would be limited by geographic location.

The Pennsylvania Special Education Assistive Device Center is a statewide service of the Central Pennsylvania Special Education Resource Center, that is putting this type of model into practice. That program, which includes long-term loans of communication aids/computer access tools, has been described in several chapters within these proceedings.

The Hugh McMillan Medical Center in Toronto coordinates the Assistive Devices Program (ADP) of the Ontario Ministry of Health. In their model, Level 1 sites are again primary/remote "clinics," function as primary referral sources, are responsible for day-to-day program implementation, and have minimal prescriptive authority. Level 2A sites have a written agreement with ADP to authorize and prescribe devices on a limited basis. Level 2B sites are authorized to prescribe all but the most complex devices, and have ready access to technological support. The level 3 site has authorization to prescribe all devices, inhouse positioning/seating facility, staff with major emphasis and training in augmentative communication, the ability to customize and maintain equipment, a university or educational affiliation with clinical teaching and research responsibilities, promotes networking of clinics, takes responsibility for program and clinical consultation to other programs and so on. The issue of "authorization" to prescribe devices relates to the automatic funding of a device by the Ontario Ministry of Health ADP as long as the recommendation is from an authorized facility.

Hennepin County Intermediate School District 287 serves students with low incidence handicaps (this includes vision impairment, hearing impairment, physical handicap, and mental retardation) who reside in the western suburban area of Minneapolis (Frush, 1986). Students are served almost exclusively in their home school settings. In addition to occupational therapists (OTs), physical therapists (PTs), speech-language pathologists (SLPs), vision and hearing specialists and special education teachers, this district employs a computer programmer. Through their team approach, and with excellent administrative support, they have made impressive gains for their students, and have developed some very useful software tools in the process.

In California, the UCLA Intervention Program and the Los Angeles Unified School District (LAUSD) (Special Education) have collaborated to look at the implementation of technology for children in special education programs. Team members have included educators, speech therapists, PTs, OTs, and a fundraiser and team leader. As the program continued, in-services were offered to LAUSD schools/ teachers to help them become more comfortable with technology.

In September 1984, the Boston Public Schools, Department of Student Support Services, formed the Special Education Technology Resource Center. One component of the center is a software lending library. Another is a model adaptive hardware laboratory with a variety of input and output devices. Two of each device were purchased so that one remained in the lab for demonstration and training, while one could go out for loan for periods of trial use. A third component is

staff training, and a fourth is evaluation of the most involved students, design of intervention plans, and technical support to the staff in charge of implementing the plan.

Looking at the five models just described, it should be noted that the first two are attempting to deal with the issue of effective service delivery over a wide geographic area, while the last three are programs implemented in large metropolitan areas.

The model not yet discussed is the traditional evaluation center, most often located at a hospital or university speech clinic where there is a staff/faculty member with expertise in the area of augmentative communication. The assessment model at the Trace Center, to be described, is in this category, and functions basically in the same way as Yorkston and Karlan's (1986) tertiary level team.

EVALUATION MODEL AT THE TRACE CENTER

The Trace Center has two affiliated programs which provide evaluations: the Communication Aids and Systems Clinic (CASC), and the Communication Development Program (CDP).

CASC is part of the Department of Speech-Language Pathology, University of Wisconsin Hospital and Clinics in Madison, Wisconsin. The clinic team includes communication specialists, a position/seating specialist, and a communication aids specialist. The team works together with the client, family, and other significant others in evaluating the individual's needs and abilities to determine the most appropriate approach. Evaluations are on a fee-for-service basis, and are usually funded by sources such as Medical Assistance, private insurance, DVR, and school districts. CASC is located in the Waisman Center, as is the Trace Center. There is shared staffing between the two programs, and CASC has access to Trace engineers through a rehabilitation research services program for customization of equipment. Clients come from all areas of Wisconsin and surrounding states, with some clients travelling from more distant states and other countries.

The process of selecting a communication system for an individual can be viewed as a puzzle with three primary pieces. Each individual brings to the evaluation his or her own unique physical abilities, as well as past experiences and future goals. All of these factors help determine the shape of the puzzle pieces. The other major component in the puzzle is the environment in which he or she lives. This includes the people with whom he interacts, as well as the physical situation in which he is operating. For example, one person might be living in a nursing home, and another may be living at home and going to school daily. Those two situations put different constraints on the communication system for the two individuals. The people that the person has an opportunity to interact with will also have an impact on the most appropriate communication system.

The third factor which has a bearing on the actual system selected is the other assistive devices that the individual may use daily (for example, crutches, wheelchairs, a head support system, straps, wrist splints or reaching devices). Remaining in the middle is a gap into which must be fitted a means for effectively and systematically communicating. Often it is not a case of simply one particular device being needed to meet the various communication needs of the person. For example, a child may use a pointer to indicate items on a communication board, use gestures to convey their ideas, and vocalize for yes and no and to gain attention. These are all part of his/her communication system. The critical variables to consider in examining the options available for this last piece of the puzzle, the communication system, are:

1. the means of indication, and
2. the symbol system to be used.

Additional factors come into play at a later point, once these two set central issues have been determined.

These puzzle pieces are all needed for communication. When the best fitting central piece (e.g., communication board or aid) has been chosen and put in place, it is like completion of a bridge. Now communication can flow back and forth over the bridge as long as people know the rules for crossing over. The aid is simply a tool or an enabler. People on both sides, however, must learn to use it effectively. Once the mechanics of operating the aid have been resolved, the ways in which it can be incorporated into daily interactions must be stressed. Encouragement of further language development and increased expressive skills is necessary (DePape). The following is a general description of procedures developed as part of the evaluation process at CASC. Detailed flow diagrams of CASC activities and procedures that have been put together by DePape, clinical director of CASC, accompany this paper.

Referral: Any person who does not use speech as a primary interaction mode, whose speech is not functional, who does not have a functional writing system, or who requires assistance in the area of computer access may be referred.

Screening: Prior to scheduling an appointment, preliminary information is obtained through written reports and telephone conversations to ensure that CASC is the most appropriate resource.

Case Review: Once the appointment is scheduled, additional information, medical reports, school/therapy reports and a videotape are requested. This information is reviewed at least one week before the appointment, and any arrangements for special transportation or hospitalization are made.

Evaluation: The evaluation will vary in length depending on the individual problems to be tackled. They average four to six hours. In some cases, the evaluation is divided between two consecutive days, but most often it is conducted in one day. Three areas of emphasis are: 1) positioning and seating, 2) communication skills and needs, and 3) communication aids and interfaces. Generally, the evaluation begins with positioning and seating because of its pivotal role in facilitating movement which will be needed for the subsequent sections. While individual specialty evaluations are undertaken, the major part of the evaluation is done using a team problem-solving approach. Recommendations are discussed with the referred person and his/her family at the end of the evaluation and a schedule for implementation is developed together.

Implementation: Depending on the recommendation made for the individual, equipment may have to be ordered and/or constructed as part of the total augmentative communication/interaction system. Subsequent visits are scheduled if necessary for adjustments to equipment to ensure proper fit. Recommendations involving training in the use of special graphic systems, the development of physical skills, or specific communication interaction strategies may need to be implemented cooperatively with professionals in the home community.

Follow-Up: Since the person's communication needs will change over time, as will physical size and physical abilities, reevaluations are recommended to assess fit and function of all aspects of the system developed.

The other Trace program with an evaluation component is the Communication Development Program (CDP). CDP is funded by the Dane County Unified Services Board to provide envi-

ronmentally based services to developmentally disabled residents of Dane County, ages 0-4 and 18 and over, with severe expressive communication disorders. Because of this funding, there is no fee for clients meeting those criteria. The program shares staff with CASC and other Trace Center programs; however, it is staffed only by communication specialists. Other team input must be sought through referral to other sources. Rehabilitation engineering assistance is available through Trace engineers.

The evaluation process is basically the same as that described for CASC, with a few differences. One is the need for outside access and scheduling to create a team, mentioned above. Second is the CDP emphasis on environmentally based services.

Evaluations, because clients are all within a contained geographic area, include observation of daily activities. The increased emphasis on vocational opportunities in community settings and the move out of state residential institutions have resulted in a greatly increased demand for services over the past two to three years. An underlying philosophy of both CDP and CASC is the importance placed on the assessment of the environment and the individual's communication partners. Studies have been done that support the critical nature of this factor, showing that partner training has resulted in increased interactions, while client training alone has had minimal effect on interaction patters (Blackstone, 1986).

STRENGTHS AND WEAKNESSES

The following are strengths of a traditional, university/ hospital-based evaluation model such as that represented by CASC.

1. Because of the affiliation with Trace Center, there is a great deal of expertise and experience available in areas of augmentative communication, writing systems, and computer access. The information program at Trace helps staff stay up to date on current and upcoming trends and available tools. Access to engineers on staff at Trace facilitates necessary modifications to equipment.
2. The emphasis on communication needs and environmental support is critical to any good evaluation program.
3. Positioning and seating is an integral part of evaluations.
4. The university affiliation allows training experiences for future professionals through guided experiences (practicums).
5. Comprehensive reports provide documentation of findings and recommendations for implementation.
6. The CDP program has a particular strength in its environmental consultative focus, providing direct service as demonstration to other professionals and family members interacting with clients.

The following are weaknesses of a traditional model.

1. It is difficult to achieve adequate/consistent follow-up. Problems that contribute to this include the wide geographic spread of clients, the non-refundable nature of follow-up activities (letters, phone calls, etc.) in a fee-for-service structure, FTE limitations imposed by university regulations and hospital funding limitations, and scheduling/logistical problems when multiple sessions are necessary.
2. Staff drain and burn-out is a serious problem. Much of that relates to the general issues in #1. It is frustrating not to be able to follow up on clients

more consistently. Many of the activities important to effective evaluation services fall under the category of "nonfundable time," and must be done on staff's own time. These include reports, phone follow-up, follow-up travel, planning, material preparation, equipment maintenance, new equipment orientation, and information dissemination/ advocacy.

IMPLICATIONS/SUGGESTIONS/RECOMMENDATIONS

The possibility of statewide service delivery mechanisms is an exciting one. I believe it is the critical step needed to move from evaluation and intervention that is widely diverse in quality and effectiveness for children in different locations (a problem felt especially in smaller cities and towns, in rural areas, and in states with large geographic areas). There are good, dedicated professionals in all locations, but until now their efforts have largely been on their own time. As long as this holds true, it is a hard fact that the number of professionals developing sufficient expertise to make a difference for our children with severe expressive communication disorders will remain limited. Technology and new methodology give immense instructional power, but without knowledgeable professionals to recommend appropriate devices and to guide their application in meaningful, functional ways, their introduction is destined to result in frustration and failure. Too often, that has been the case in the past. The reason that this Great Lakes Area Regional Resource Center (GLARRC) initiative is exciting is that if statewide systems are implemented, the support for communication system development and implementation will come from the place it must come from to work -- from the administrative level. If the support is not there, no amount of grassroots, person-by-person advocacy will make a lasting change, and there will continue to be only unpredictable pockets of knowledgeable staff. The guidance and support must come from that level so that all/any staff can/will carry through with implementation recommendations. The following are suggestions generated from this discussion of assessment, and the view of assessment as an integral part of continuing service delivery.

- The evaluation process should not be viewed as just equipment recommendation, but as the critical initial step in planning for functional application and incorporation into the individual's environment. An assistive device should be kept in perspective: not as the solution, but as a tool that will allow educators to deal with primary deficit and remediate secondary deficits.
- The outcome of an evaluation should include information relevant to use of the optimal communication system for skill development (physical, academic, linguistic, social, etc.), increasing opportunities for interaction, increasing opportunities to work independently, increasing expectations for communication, and making consequences more consistent.
- Not all evaluations will result in recommendation of a technologically based assistive device. Only one-third of the clients seen in CASC receive recommendations for an aid at an initial evaluation. More frequently, recommendations focus on skill development and increased opportunities for interaction using a low-tech system (e.g., communication board). The value of these systems and the time-intensive nature of their development must be recognized.
- We must look to future environments and maximize independent function. As stated by Bigge (1976, page 1), "Whatever their potential for participating in the society in which they find themselves, we want to help children learn those skills and adaptive behaviors needed for self-sufficiency."

  Providing a 1:1 aide to complete written work gets it done, but how does it

prepare the student for functional application of knowledge in the future? Where will the aide be then? We must decrease reliance on such strategies that use a 1:1 aide as the output mechanism, and increase the utilization of aides for set-up and support of a system that will enhance transition to the next environment.

- Assessment should not be considered a separate activity, but an ongoing part of educational planning. The importance of performance trials and diagnostic therapy should be emphasized.
- More streamlined report formats, checklists and application notes should be a part of any evaluation model, to best utilize staff time and decrease staff burn-out.
- Time must be provided: time for material development, time for training, time for follow-up, time for system support. Rodgers (1985) describes the elements necessary for "holistic application;" that is, "making available a complete system where all the elements to use technology are in place." Out of the 19 elements listed by Rodgers, only one focuses on the hardware and software itself. The other 18 items relate to services that support the user and the system over time. It must be clearly recognized that providing the device alone is not enough -- there must be time and commitment to the functional use and support of that aid if it is to be a successful tool.
- Now that I have emphasized the support and not the tools, let me say that first there must be the tools. Without readily available assistive devices, assessment recommendations cannot be put to actual use in performance trials; skill development activities with equipment which will lead to recommendation of another system become difficult to implement; long time delays result in frustration. Communication aids should be considered as tools/material resources necessary for the implementation of IEPs. (1985-86 Education of the Handicapped Law Report [Dec. 507:416]).

An eight-year-old cerebral palsy student in San Francisco who did not communicate orally had an IEP that included provision of a computer system and voice synthesizer to meet his communication needs. Although the IEP was signed in April the equipment specified that the IEP was not available until October. In addition, neither the teacher nor the classroom aide were trained to teach the child to use the computerized communication system.

During the interim, the parents obtained speech-language pathology services from a private practitioner. The parents initiated the due process hearing to seek immediate implementation of the augmentative communication system and to obtain reimbursement for the services they had to obtain from a private practitioner.

The hearing officer's decision was in favor of the parent. The hearing officer found that the school was not implementing the current IEP and that the school district was not providing an appropriate education because of its failure to provide the computerized communication system in a timely manner to train the teacher and aide to use the system in teaching the student. In a statement included with the decision, the hearing officer stated:

> The purpose of having special education programs is to teach handicapped children such as the Petitioner. For each handicapped child an IEP is developed. When a properly developed IEP is followed, the child should derive some educational benefit. In this case, a critical element of the IEP is the implementation of a system of communicating with the Petitioner. If you cannot communicate with him you cannot teach him. The

> IEP team determined that to appropriately communicate with the Petitioner a computer system should be implemented. However, it is obvious that any such system is useless unless the people who are going to be working with the system are trained to use it. Therefore, in order to implement the IEP and to teach the Petitioner, whoever works with him must be appropriately trained.
>
> (GAR, August 1986)

CONCLUSION

"Would you tell me, please, which way I ought to go from here?

"That depends a good deal on where you want to get to," said the Cat.

"I don't much care where --" said Alice.

"Then it doesn't matter which way you go," said the Cat."

"-- as long as I get somewhere," Alice added as an explanation.

"Oh, you're sure to do that," said the Cat, "if only you walk long enough."

The field of augmentative communication is a fairly new one, and is changing and growing rapidly. The quality of available communication aids continually improve. Knowledge of how to use these tools is developing. We are certainly getting somewhere. It is my hope that this planning conference will result in an understanding that it does matter "which way we go" and in a clearer definition and plan for "where we want to get to" so that all children with severe expressive communication disorders can benefit from these advances, and not have to wait until we get there just by "walking long enough."

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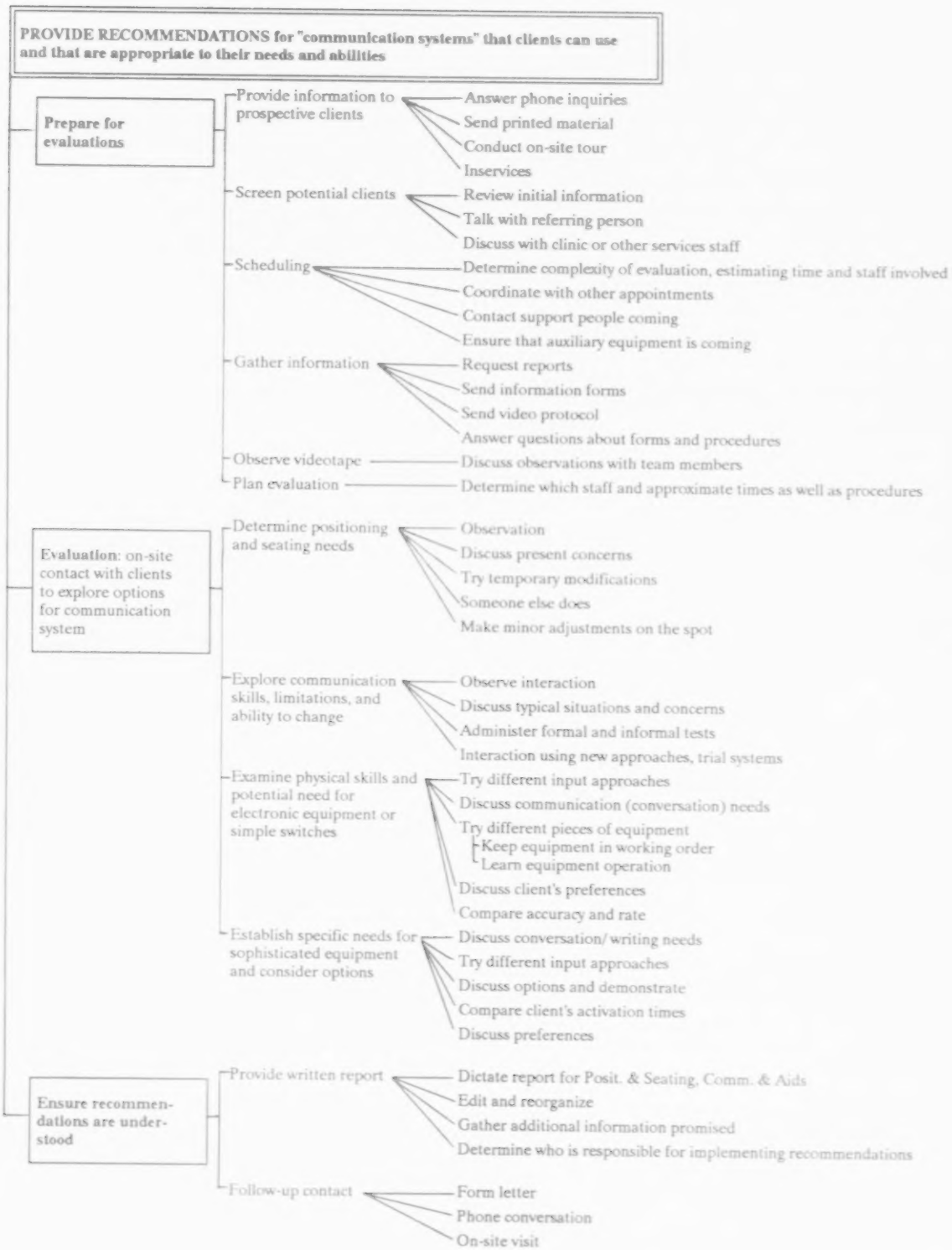
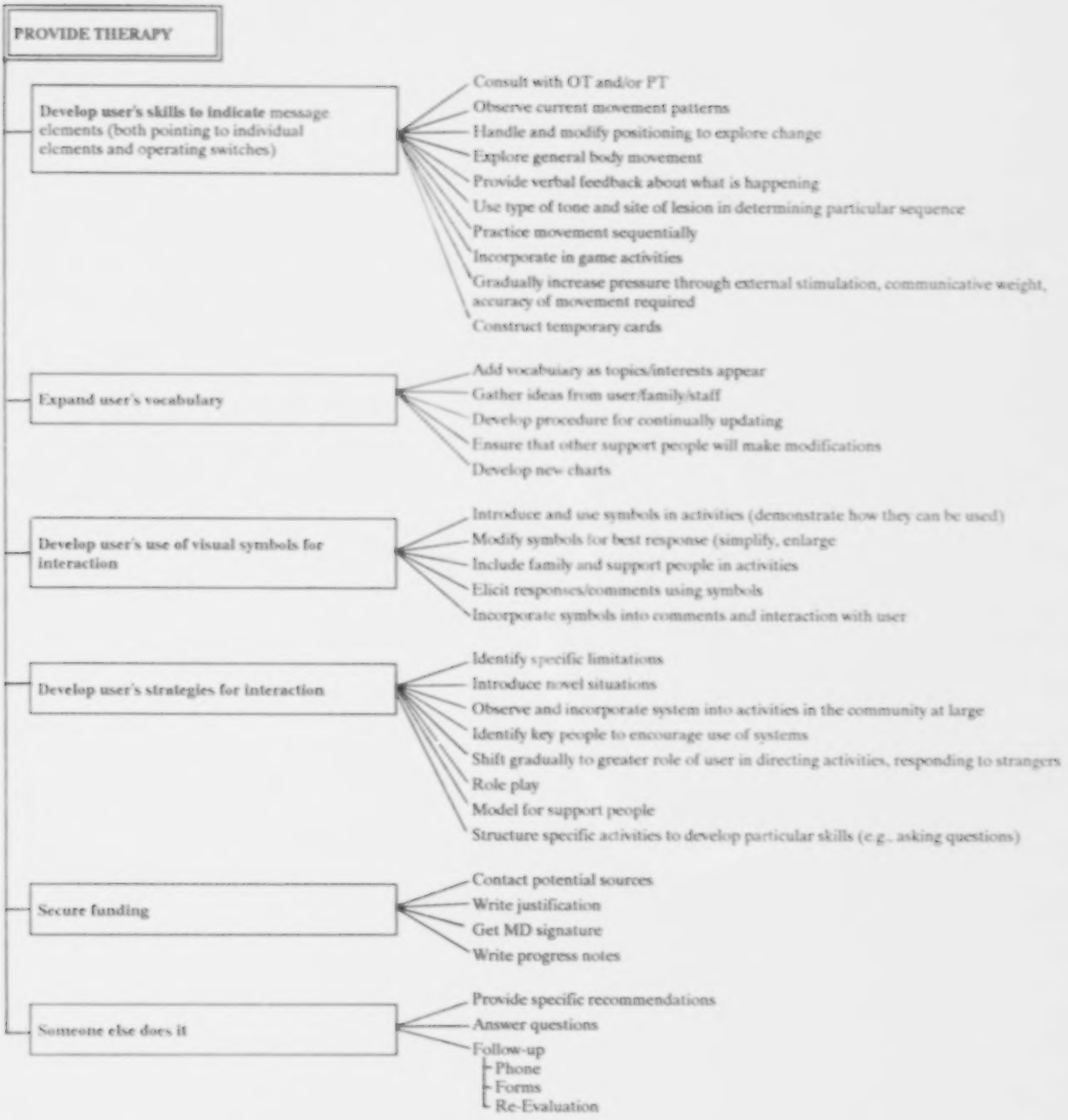
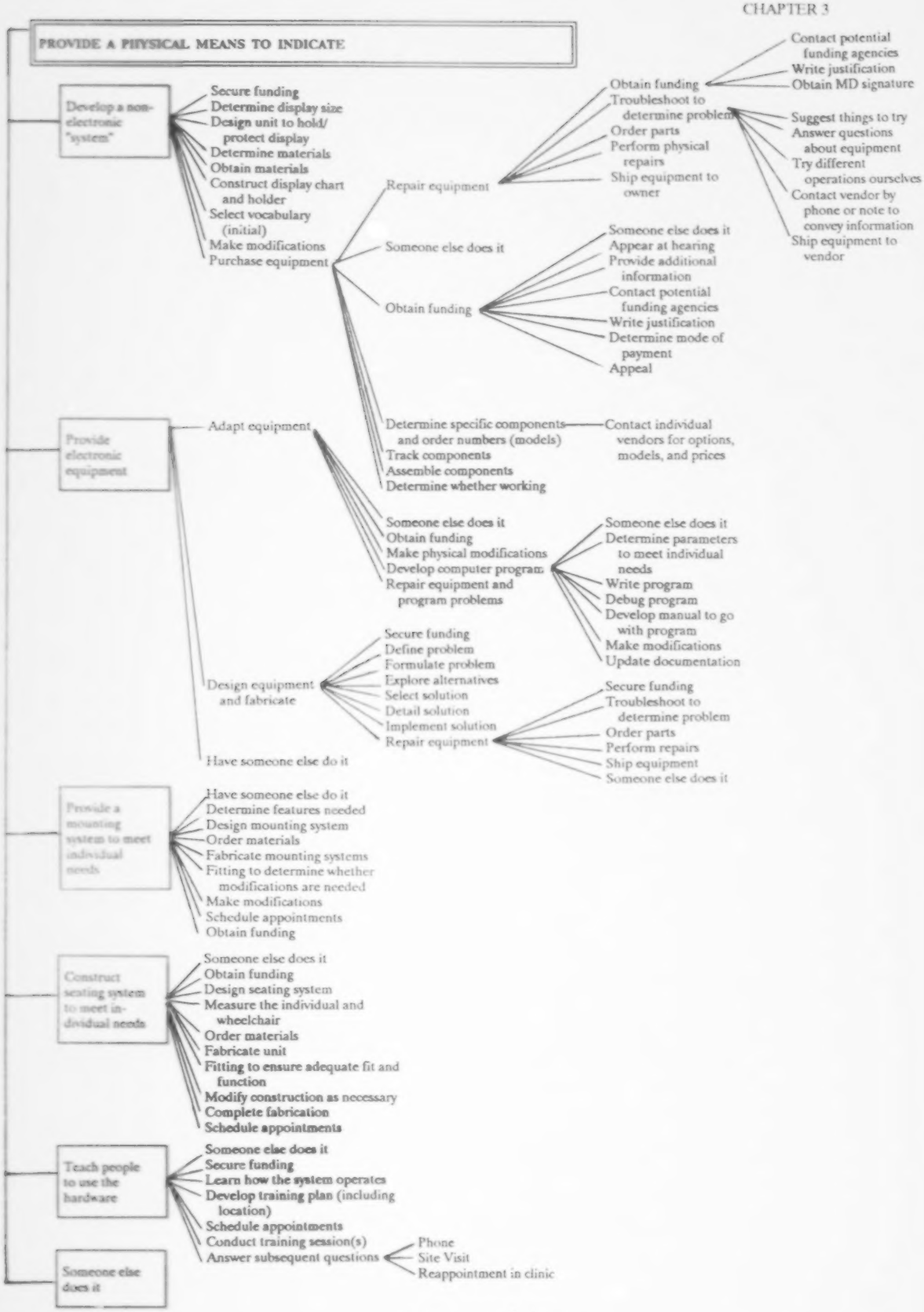

PROVIDE RECOMMENDATIONS for "communication systems" that clients can use and that are appropriate to their needs and abilities
Prepare for evaluations
Provide information to prospective clients
Answer phone inquiries
Send printed material
Conduct on-site tour
Inservices
Screen potential clients
Review initial information
Talk with referring person
Discuss with clinic or other services staff
Scheduling
Determine complexity of evaluation, estimating time and staff involved
Coordinate with other appointments
Contact support people coming
Ensure that auxiliary equipment is coming
Gather information
Request reports
Send information forms
Send video protocol
Answer questions about forms and procedures
Observe videotape
Discuss observations with team members
Plan evaluation
Determine which staff and approximate times as well as procedures
Evaluation: on-site contact with clients to explore options for communication system
Determine positioning and seating needs
Observation
Discuss present concerns
Try temporary modifications
Someone else does
Make minor adjustments on the spot
Explore communication skills, limitations, and ability to change
Observe interaction
Discuss typical situations and concerns
Administer formal and informal tests
Interaction using new approaches, trial systems
Examine physical skills and potential need for electronic equipment or simple switches
Try different input approaches
Discuss communication (conversation) needs
Try different pieces of equipment
Keep equipment in working order
Learn equipment operation
Discuss client's preferences
Compare accuracy and rate
Establish specific needs for sophisticated equipment and consider options
Discuss conversation/ writing needs
Try different input approaches
Discuss options and demonstrate
Compare client's activation times
Discuss preferences
Ensure recommendations are understood
Provide written report
Dictate report for Posit. & Seating, Comm. & Aids
Edit and reorganize
Gather additional information promised
Determine who is responsible for implementing recommendations
Follow-up contact
Form letter
Phone conversation
On-site visit


PROVIDE THERAPY
Develop user's skills to indicate message elements (both pointing to individual elements and operating switches)
Consult with OT and/or PT
Observe current movement patterns
Handle and modify positioning to explore change
Explore general body movement
Provide verbal feedback about what is happening
Use type of tone and site of lesion in determining particular sequence
Practice movement sequentially
Incorporate in game activities
Gradually increase pressure through external stimulation, communicative weight, accuracy of movement required
Construct temporary cards
Expand user's vocabulary
Add vocabulary as topics/interests appear
Gather ideas from user/family/staff
Develop procedure for continually updating
Ensure that other support people will make modifications
Develop new charts
Develop user's use of visual symbols for interaction
Introduce and use symbols in activities (demonstrate how they can be used)
Modify symbols for best response (simplify, enlarge
Include family and support people in activities
Elicit responses/comments using symbols
Incorporate symbols into comments and interaction with user
Develop user's strategies for interaction
Identify specific limitations
Introduce novel situations
Observe and incorporate system into activities in the community at large
Identify key people to encourage use of systems
Shift gradually to greater role of user in directing activities, responding to strangers
Role play
Model for support people
Structure specific activities to develop particular skills (e.g., asking questions)
Secure funding
Contact potential sources
Write justification
Get MD signature
Write progress notes
Someone else does it
Provide specific recommendations
Answer questions
Follow-up
Phone
Forms
Re-Evaluation


PROVIDE A PHYSICAL MEANS TO INDICATE
Develop a non-electronic "system"
Secure funding
Determine display size
Design unit to hold/protect display
Determine materials
Obtain materials
Construct display chart and holder
Select vocabulary (initial)
Make modifications
Purchase equipment
Repair equipment
Obtain funding
Troubleshoot to determine problem
Order parts
Perform physical repairs
Ship equipment to owner
Contact potential funding agencies
Write justification
Obtain MD signature
Suggest things to try
Answer questions about equipment
Try different operations ourselves
Contact vendor by phone or note to convey information
Ship equipment to vendor
Someone else does it
Obtain funding
Someone else does it
Appear at hearing
Provide additional information
Contact potential funding agencies
Write justification
Determine mode of payment
Appeal
Provide electronic equipment
Adapt equipment
Determine specific components and order numbers (models)
Contact individual vendors for options, models, and prices
Track components
Assemble components
Determine whether working
Someone else does it
Obtain funding
Make physical modifications
Develop computer program
Repair equipment and program problems
Someone else does it
Determine parameters to meet individual needs
Write program
Debug program
Develop manual to go with program
Make modifications
Update documentation
Design equipment and fabricate
Secure funding
Define problem
Formulate problem
Explore alternatives
Select solution
Detail solution
Implement solution
Repair equipment
Secure funding
Troubleshoot to determine problem
Order parts
Perform repairs
Ship equipment
Someone else does it
Have someone else do it
Provide a mounting system to meet individual needs
Have someone else do it
Determine features needed
Design mounting system
Order materials
Fabricate mounting systems
Fitting to determine whether modifications are needed
Make modifications
Schedule appointments
Obtain funding
Construct seating system to meet individual needs
Someone else does it
Obtain funding
Design seating system
Measure the individual and wheelchair
Order materials
Fabricate unit
Fitting to ensure adequate fit and function
Modify construction as necessary
Complete fabrication
Schedule appointments
Teach people to use the hardware
Someone else does it
Secure funding
Learn how the system operates
Develop training plan (including location)
Schedule appointments
Conduct training session(s)
Answer subsequent questions
Phone
Site Visit
Reappointment in clinic
Someone else does it

CHAPTER 4

THE ASSESSMENT AND EVALUATION OF CLIENTS FOR AUGMENTATIVE COMMUNICATION SYSTEMS: THE PENNSYLVANIA MODEL

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The Pennsylvania Assistive Device Center has been distributing high technology assistive devices in the schools and providing educational training in the assessment of clients and evaluation and selection of systems for augmentative communication. The Pennsylvania Assistive Device Center has designed a program and materials for providing this training on a statewide level.

DESCRIPTION OF THE PENNSYLVANIA MODEL: A BRIEF HISTORY

Approximately three years ago the Pennsylvania Assistive Device (ADC) center was conceived to provide appropriate and necessary technology to handicapped students in the state. The project focused on communication, writing aids and computer access at this time rather than on sensory aids, environmental control, mobility or independent living aids. This decision was a result of a population survey that demonstrated that the greatest need was for technology for communication.

Pennsylvania is a state representing 12 million people and covering approximately 45,000 square miles. Within this population, approximately 200,000 children have been identified as having handicapping conditions that could possibly warrant ADC services. These 200,000 children are educated or monitored by their Local Educational Authority, the Intermediate Units. The 45,000 square miles of Pennsylvania are divided into 29 Intermediate Units. Originally, the ADC staff consisted of three members: an educational technologist, a rehabilitation engineer and a speech pathologist. The ADC staff studied many of the assessment and evaluation strategies and models represented by centers throughout the United States and Canada. The ADC was very impressed with the procedures of such centers as The Hugh MacMillan Center, Toronto, Canada; the Communication Systems Evaluation Center, Orlando, Florida; and The Assistive Device Center, Sacramento, California. However, the Pennsylvania Assistive Device Center was concerned with the medical model that these agencies presented in regards to: a "one shot" visit approach, where the clients were seen in a "center" or clinic that was unfamiliar to them, and the client was usually seen by people unfamiliar to them, and asked to perform specific tasks. In addition, valuable information from those persons knowing the client in their natural environment, such as additional family members, teachers, occupational therapists, speech pathologist, etc., was limited to written communication via a questionnaire, therapy summary report, or the relaying of information through the parents or the few persons able to attend the assessment with the client. In addition, because of this approach, many clients were placed on waiting lists and literally waited for years for an assessment and evaluation.

The ADC first attempted a modified medical model version and began to travel to a student's school to do an assessment and evaluation. This kept the student in his/her natural environment and provided the ADC staff with an opportunity to meet and discuss important questions and issues with the staff currently involved with the student. It became apparent quite quickly that this approach was inadequate. The ADC staff was travelling all over the state and was still representing a "one shot" visit approach. The student might be absent from school on the day of assessment. There were snow delays and school cancellations. The assessment procedures took longer than expected. It was an exhausting procedure for all involved.

In 1985 The Department of Education, Bureau of Special Education responded positively to the interest and need for expanded services for technology for assistive devices and allocated $500,000 from the PL 94-142 funding for equipment for an assistive device loan program. Professional education staff who served one or more students with handicaps were eligible to apply for an assistive device loan. Guidelines and forms were available at the local educational authority. Suddenly, every professional applying for an assistive device through the loan program wanted an assessment and evaluation. The small staff attempted to respond to the needs of the population, but it became an overwhelming impossibility to attempt to schedule individual assessments and evaluations. (The ADC staff were able to provide approximately 50 "one-shot" assessments and evaluation consultations for this population that numbered over 300.)

At this time, it became necessary to devise and implement a framework to support the local educational agencies and each intermediate unit. It was necessary to hire additional ADC staff members to provide technical and clinical support through educational training with workshops, printed materials, toll-free technical Hotline service, videotapes, newsletters, site visits and educational modules. A new plan of action was structured that incorporated and reinforced the basic beliefs of the ADC staff's philosophy on assessments and evaluations for assistive device systems use. The Local Augmentative Specialist Plan was developed using an educational model for assessment and evaluation.

Description of the PA Assessment Model: The Local Augmentative Specialist Network

The ADC asked each local educational agency and the 29 intermediate units to select three professionals from their staff to be trained as Local Augmentative Specialists. The ADC suggested that the intermediate units (IUs) survey their staff and select professionals who appeared to be already interested in assistive devices or technology. The IUs were also encouraged to develop a "team approach" to include a speech pathologist, an occupational therapist and/or a physical therapist, and an educational technologist and/or teacher. Responsibilities of the Local Augmentative Specialists would be to provide local support of the long-term loan program conducted by the ADC, and to provide consultations for assessments of students and of equipment for students who needed augmentative and/or alternative communication.

Once the Local Augmentative Specialists were identified, the ADC surveyed the group to discover their present basic knowledge of assistive devices; their ability and/or confidence in selecting and programming devices, and their readiness and ability to create educational goals and procedures for training other staff who were working with an assistive device user. The response and cooperation from each IU was very surprising and supportive. All 29 IUs participated and selected staff to become Local Augmentative Specialists (LASs). Results of the ADC survey showed 34% had "some" experience with high technology, 40% had "no to little" experience, and 27% felt they had "fair to good" experience. Of the group identified, 46 were speech pathologists, 3 were administrators, 8 were occupational therapists, 5 were physical therapists, 11 were teachers and 14 were "other." Fifty percent of the group had "little to no" experience with the majority of commercially available communication aid devices. Nineteen percent had used some of the

devices before, but did not understand the devices and functions of the systems very well. The educational module that the LAS selected as being most important to them would be a training module on assessment and evaluation.

Description of the PA Model: LAS Training Aspects/Equipment/ Plans

First, the ADC staff selected a basic "starter" group of items and resource materials that might be beneficial to conducting an assessment of a client for an assistive device. These clinical tools were gathered in a suitcase that was called the LAS assessment kit. In addition to the clinical tools and books, the LAS kit included videotapes made by the ADC that demonstrated the basic use and programming of the most currently popular and commercially available assistive devices: the TouchTalker™ and LightTalker™ from Prentke-Romich, the EvalPAC/SpeechPAC 4™ from Adaptive Communication Systems and the Adaptive Firmware Card from Adaptive Peripherals. Each IU's LAS team was given a complete LAS assessment kit at the first LAS training workshop.

The ADC plan for LAS training includes three major educational workshops a year for each LAS team. The ADC conducts these workshops within three geographical areas of the state: west, east and central Pennsylvania. The LAS then attend the workshop being conducted nearest to them. Each workshop consists of a full day of educational training that includes presentations by the ADC staff members, and/or guest lecturers that are renowned experts in the field, and/or "hands on" experiences with the actual devices, audiovisuals, tutorials, and print materials. In addition to these one day workshops, the ADC will provide opportunities for the LAS to attend segments of a graduate course in augmentative communication held at Bloomsburg University and/or the opportunity to attend a three-day augmentative retreat held in Pennsylvania in conjunction with ISAAC (The International Society of Augmentative and Alternative Communication).

The ADC also provides the LAS with "on site" training during the ongoing, follow-up site visits the ADC staff regularly make to students who were awarded the long-term loan devices. Suggestions and training techniques are demonstrated to the LAS, and the ADC staff then can consult with the LAS on any problems or situations they may currently be handling.

Short-term loan of devices is provided by the ADC throughout the state to LAS. The LAS team then has the opportunity to try an actual device or system with a student, before making a final suggestion or recommendation for the equipment to be purchased or applied for through an ADC long-term loan.

Toll-free technical Hotlines operate at the ADC, Monday through Friday from 8:00 to 5:00. The LAS may use these lines for technical assistance, hardware information, technological problem solving and device programming. Concerns about seating and positioning information, symbol and vocabulary selection information, therapy implementation, problem solving, and requests for site visits may also be discussed over the phone.

The LAS receive the Assistive Device News newsletter and are referred to other LAS from various sites in the state LAS NETWORK to share similar experiences, successes and/or problems. Each LAS receives the Augmentative Communication Profile, a survey designed by the ADC as a tool to help therapist and teachers identify the student's strengths and weaknesses in using the present augmentative system. Once the questionnaire portion of the Augmentative Communication Profile is completed, the ADC will analyze the data and return the information with a graphed profile, and suggestions for plotting efficacy of the current communication system.

In 1986-1987, the main focus of the ADC training for the newly developed LAS program was to develop materials, share, and transfer information and experiences in the area of assessment and evaluation.

Training materials are currently being designed to meet this need. A professional videotape is being prepared as well as a bibliography of resources and forms to accompany it. This tape and these materials will provide a framework from which each LAS team could begin. A description of this process, its underlying principles, and a definition of terms follows:

Assessment and evaluation are terms that are often used interchangeably. However, at the ADC, both terms are defined as a part of a process. Assessment could be defined as the process of gathering facts through observation, interviews and formal and informal testing, while evaluation is the process of interpreting the information that has been gathered. The emphasis of these definitions is on the word process. Assessment and evaluation of a student for augmentative communication is truly a process rather than a particular technique or specific form. A thorough knowledge of the student is critical to this process and an interdisciplinary approach is encouraged. The student needs to be observed within familiar environments with familiar adults over a period of time. The team could be composed of the student's speech pathologist, an occupational therapist and/or a physical therapist, the student's teacher, the student's parents, siblings and peers, and the student. Any other professionals or adults such as the student's classroom aide or the school psychologist could also participate. All teams are encouraged to further develop and customize this process to fit their own needs and those of the students they serve. This process has been broken down into 10 sequential steps to promote easy explanation. The steps are as follows:

1. Identification of Student's Needs
2. Background Information on Student
3. Interview with Student's Parents, Current Staff, and Other Significant People
4. Interview and Observation of the Student
5. Motor Assessment
6. Language Assessment
7. A Match of the Student's Characteristics with Specific Equipment's Features
8. Trial Run
9. Evaluation of Results
10. Follow-up

1. Identification of Student's Needs

An explanation and description of the student's unmet needs for communication, writing, and/or access to educational materials. Questions to be answered might be: Is the student verbal or non-verbal? Is the student's speech or signing intelligible? To what degree and by whom? Does the student have physical disabilities which limit his/her ability to write, type, or use a computer? Does he/she have physical disabilities which interfere with his/her ability to write, type or use a computer without some additional assistance? Are enlarged curricular materials needed? Is he/she presently functioning in the very early stages of language and cognitive development with no present means to express intent?

2. Background Information on Student

Documentation of the student's medical diagnosis, medical history, current instructional levels, current means of communication, recent test scores and results of recent audiological and vision tests. It may become apparent at this stage that some important facts are missing and time may need to be spent obtaining the missing information. This may require phone contacts, other record reviews or support to the family and student to schedule a particular examination.

3. Interview with student's parents, current staff, and other significant people

Documentation of familiar adults' perceptions of, opinions of, concerns with, desires for, and experiences with the student. This part of the assessment process is often not formally accomplished, and yet it may be vital to the rest of the process. Issues to be considered are: What is the student's present means of communication with each of these people? Does the student have a backup system? Does the student initiate interaction? How independent is the student in his/her home? at school? in the community? What type of voluntary control does the student regularly exhibit? in what specific situations? What is the student's endurance and frustration tolerance of a particular task? What are the student's visual, hearing, writing, reading, spelling, and aid usage problems currently? if any? What is the student's language comprehension? How does the student initiate communication interaction? How does the student respond to communication interaction? How does the student ask questions? make requests? comment on personal experiences?

4. Interview and observation of student

Documentation of a particular situation with the student. The student has an opportunity to reveal his/her own needs, desires and experiences. Too often, the student is left out of this entire process. An assessment and evaluation is too often something that happens to a student instead of with him/her. The assessment process may also only look and describe the student in separate pieces and with particular characteristics. It is critical that the student be looked at as a whole person, in a typical situation, and included in the decision-making as much as possible. Issues to be concerned with are the same as listed in the Interview #3.

5. Motor Assessment

An observation and description of the student's actual performance on given motor tasks. This part of the assessment needs to be completed by an occupational therapist, physical therapist or both. The student's gross and fine motor abilities must be described as well as tested. Particular areas of importance include: What parts of the student's body have the most consistent, voluntary control? What type of seating is the student currently using? What type of seating and positioning is needed? Are there any limits or contraindications for any particular movements, especially in the arms/hands/fingers, feet/legs/hips, head/neck/trunk? Is the student able to maintain a stable position? How independent is the student in mobility? Does the student operate a powered chair? How long can the student stay at task without fatiguing physically? What are the student's coordination skills like? What are the student's perceptual-motor skills? Does the student exhibit any noticeable loss or diminution in sensation, vision, strength, or power? Is the student's physical condition stable, degenerative, or fluid?

6. Language Assessment

An observation and description of the student's actual performance of language skills. This part of the assessment needs to be completed by a speech pathologist. The student's receptive and expressive language must be described as well as tested. Particular areas of importance include:

Does the student recognize objects, pictures, photographs, symbols? Which, how many, when, what size? How are they presented? Does the student exhibit auditory discrimination of sounds, words, phrases, sentences? Does the student follow directions? Does the student have sight word recognition? What are the student's reading comprehension, reading, and spelling levels? Does the student desire to communicate? Does the student initiate communication? Does the student interact? What is the student's present means of communication? gestures? facial expressions? vocalizations? semi-intelligible speech? sign language? pointing? communication board? eye gaze? an electronic system? What is the student's current level/developmental age of receptive language? of expressive language?

7. A Match of the Student's Characteristics with Specific Equipment's Features

The student's needs, desires, and capabilities are listed and matched to a device's features. Issues to delineate are: How is the student going to access the device? If he/she is using direct selection, which body part will be used? If he/she is using assisted direct selection, will they be using a head pointer, chin stick, light beam, light sensor, adapted hand pointer or other device? If he/she is scanning, where will the switch be placed and which switch will be used? If the student is using an encoding system, will he/she use morse, number or letter coding? What symbol type and size will be utilized? What output(s) do he/she need and/or desire? auditory, visual, LCD, a monitor, hard copy, a combination?

8. Trial Run

Documentation of one or more actual experiences of the student with the equipment, or a simulation/"mock-up" of the equipment. It is important that at least two members of the team of adults involved are present at this time. This allows one to be with the student, supporting and encouraging the appropriate use of the equipment. The other adult can then observe how the student is actually performing the task, watching his/her body as well as the physical positioning of the device. Issues to be concerned with: Has an appropriate body site and input method been chosen? Can the student make the system work? Does the position of the device and the position of the student appear to be comfortable, safe, stable, and efficient?

9. Evaluation of Results

A summary and interpretation of all pertinent findings regarding the student and the choice of a device. It is critical that this evaluation includes the entire assessment team. A great deal of information will have been gathered on the student, and with the student and will need to be interpreted. Priorities will need to be set, compromises made, and training strategies agreed upon. There is no perfect device to match up with each individual student; an adequate device is what is hoped for. Recommendations of the assessment team need to include: the delineation of responsibilities of each team member, a description of a device and how it will be obtained, potential training strategies to be utilized by and with the student and device, and a documentation process by which the student and device usage will be monitored.

10. Follow-Up

This step in the process is sure to vary greatly with each student and with each team. The most important aspect of this step is the monitoring of the student's use of the device, who will do it and how often will it be done. One other item at this point should also be considered: Is there a "backup" system that is compatible with this equipment or one that can be readily available to the student if this system suffers a temporary breakdown?

Description of the PA Model: Efficacy and Implication of the Model

Choosing a model of assessment and evaluation services that is one of training LASs, has its advantages and disadvantages. Many of these advantages are quite obvious. It allows many more students to be seen and evaluated than any single team of experts could ever hope to see. It encourages local educational agencies to continue to develop quality evaluation procedures that can directly benefit their own students. It allows flexibility and a customization of a process to be more responsive to specific students, personal environments, and the current staff. It also encourages the ADC staff to function as a resource and a support to the LASs. The ADC can then provide technical support, information, and assistance regarding specific training techniques, actual products, new products and prototypes, and current conference and research materials.

It is also hoped that this model can be more responsive to a particular student's needs and/or problems. Use of a device can be more readily instituted by local staff directly working with the student. The staff will be more invested in the student and the use of the device if they have been a part of the decision-making process from the very beginning. Problems with the device, the student, or training strategies may be more quickly identified and modified, not to mention the fact that if local staff become more involved with the technology, the technology itself and its use will be more widespread.

This model also presents a wide variety of other options. Data collection and assessment of specific devices, and their use would be possible. Feedback from a variety and large number of clinicians would be possible. A strong network of users and/or clinicians could be developed. Actual case studies could provide rich material for further study and development in the field of augmentative communication.

For this model to work, however, a long-term loan program is what provides it with the incentive. When the devices can be funded and provided, local staff involvement increases. If the assessment and evaluation process has the built-in component of actual possession of a device, both the student and the local staff are rewarded for their efforts.

As the ADC continues to develop training materials, distribute them, and receive feedback from the field, this model will truly be tested. Its actual costs, benefits, and replicability will then be able to be evaluated.

CHAPTER 5

ASSESSMENT/EVALUATION OF CLIENTS

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INTRODUCTION

The evaluation model used at the Communication Systems Evaluation Center (CSEC) is a process which includes preevaluation, evaluation, and follow-up. It is designed to provide service to all Florida school districts, and it involves the staff of the CSEC, the student, parents, and professionals working with the student at the local school district level. Each step of the process lays the foundation for the next, and eliminates duplication of efforts from one step to the other. A team effort is fostered from the identification of an appropriate referral to the implementation of the evaluation recommendations. The team continues to act cooperatively in follow-up activities which could result in a recommendation for reevaluation, at which time the process begins to repeat itself.

OVERVIEW OF THE MODEL

Cooperation from each school district and several levels of school district personnel is necessary to successfully and effectively enact this model. A written request was made to all Florida School District Superintendents to appoint local education agency (LEA) designees to act as liaisons between the CSEC and the district in the provision of CSEC services. The superintendents responded by appointing district administrators, clinicians, and regional resource persons as designees. These designees were assigned to manage provision of the service for single or multiple districts. Training of the designees occurred through written communications, telephone contacts, pre-service training, and subsequent in-service training. Issues included in training were as follows: identification of appropriate evaluation referrals; knowledge of the referral, evaluation, and follow-up processes; acquaintance with the evaluation referral, preevaluation data collection forms, and follow-up referral forms; updates on the development of manual and electronic communication aids; and identification of local, regional, state, and national resources for assisting in the implementation of augmentative communication systems.

Through LEA training and printed informational fliers, potential service users are informed as to how to identify behaviors indicative of the need for an augmentative communication evaluation. Identification is made by locating students who exhibit one or more of the following behaviors:

- demonstrate the intent to direct the behaviors of others through language and nonlanguage means, but are being misinterpreted;
- have limited motor and sensory ability to indicate a message;
- are frustrated by inability to communicate;
- have a noticeable difference between what is understood and what is expressed; and

- speech is intelligible to familiar persons, but unintelligible to unfamiliar persons.

Any student who is identified and is between the ages of 3 and 21, enrolled in Florida's private or public schools, and a Florida resident is eligible for services through the CSEC.

The services provided are available at no cost to the LEA and the LEA is not mandated to use or include the service in its plan of instruction for the student. Program eligibility and classroom placement of students in Florida does not in any part hinge upon the evaluation/assessment findings provided through CSEC. Concurrence with the provisions of PL 94-142 is accomplished through other means. This arrangement avoids willful or accidental manipulation of CSEC findings to wield undue influence or create unrealistic expectations for the service user or the LEA. The sole purpose of CSEC is to assess or gather information about the student's communication abilities and needs and make recommendations as to how those abilities can be used effectively to meet his/her needs through implementation of an augmentative communication device.

THE ASSESSMENT/EVALUATION PROCESS

Eligibility for CSEC services is verified through receipt of an evaluation referral form which requests basic identifying information about the student, his family, and his school program. A screening of the student's motor, sensory, cognitive, and speech abilities is made through a listing of behavioral questions which the attending speech-language clinician and parents are primarily asked to answer. The screening assists in determining the student's readiness for communication and is a deciding factor in how the referral is processed. If the basic eligibility criteria are not met or the student's speech difficulty is determined to be correctable, the referral is rejected. A postponement is given to a student who does not demonstrate readiness skills for communication and a Goal and Resource Guide (GRG) is forwarded to the local school district. The GRG is intended to aid the student's teachers and therapists in planning activities which will prepare the student for augmentative communication. If the student is nonspeaking or unintelligible and demonstrates readiness to communicate, a preevaluation packet is sent to the LEA designee.

Local education agency designees distribute and collect referral and preevaluation data, including written reports and videotapes, which the evaluation team studies in preparation for the on-site evaluation. A preevaluation packet may include a permission slip for obtaining school and medical records; videotape protocol which describes the information to be taped; and preevaluation data collection forms for the student's parent, teacher, speech-language clinician, occupational therapist, and physical therapist. The data collection forms provide the opportunity to share differences in the student's performance from one setting to another, delineate the student's assets and liabilities, identify the student's communication needs in different domains, and address specific questions to the evaluation team. The content of the packet is determined by the program description presented on the evaluation referral form.

Preevaluation data collection occurs in the local school district; however, prior to the student traveling to CSEC for an on-site evaluation the team meets to develop an on-site evaluation protocol. The protocol establishes the pace of the evaluation day by noting the skills to be evaluated, the order in which the evaluation will proceed, and the equipment and supplies needed to complete the evaluation. Since preevaluation data may be dated by the time the student is scheduled for an on-site evaluation, the team sends a written request to the school district for any updated data they deem necessary and reminds everyone of the appointment date and any equipment or reports they should bring with them. The student receives either a coloring book or an audio tape which familiarizes him/her with what can be expected when he/she visits the CSEC.

The CSEC evaluation team includes professionals who are experts in physical therapy, occupational therapy, speech-language therapy, and education. The physical therapist positions the student for best stability, energy efficiency, and best access; the occupational therapist defines the most reliable and energy efficient means of indicating a message and determines the best size and visual content of the graphics to be displayed on the communication device. Specifying how the student understands and uses language in an interactive fashion falls to the speech-language clinician. Finally, the educator supplies data regarding the student's learning style and understanding of device input and retrieval strategies.

On the day of the on-site evaluation, the student and his/her parents, teachers, and therapists begin to play a more active role in the evaluation process by joining the CSEC team to identify the student's augmentative communication needs in the school, home, and community; gather additional data in respect to the student's motor, sensory, language, interactive, and cognitive abilities; and select a functional augmentative communication system for the student's use. The evaluation day, which runs six to seven hours, includes disciplinary evaluations and trial use of manual and/or electronic communication aids. It culminates with an oral recommendation session in which all questions and concerns raised prior to and during the evaluation are addressed. This provides an opportunity for all team members to come to an agreement about the student's augmentative communication program. The visitors leave with information they can act upon prior to receipt of a full written report which is distributed according to their instructions.

Because CSEC owns an inventory of electronic communication aids, there is no dependence on vendors or device manufacturers for provision of the evaluation service. Devices are analyzed and critiqued on their merit for each student and nothing else.

This model not only recognizes communication as a dynamic process, but also recognizes that developing children are always in a state of change which may result in the need to modify, change or update their augmentative communication system(s). Students evaluated by the CSEC are automatically eligible for follow-up services. Follow-up is intended to assist local school district personnel in implementation of CSEC recommendations. The service is provided via telephone and through on-site visits to the local school district. Modifications and changes are usually finalized during the follow-up visit and updates result in a recommendation for reevaluation. The CSEC staff composition for a follow-up team varies between two to three members, and its professional make-up is dictated by the needs stated on the follow-up referral form. Students access follow-up services by contacting their LEA designee for a referral form. The referral form requests an explanation of the specific problems being encountered, action that has already been taken, any action that is planned, a listing of the persons who are working with the student, and preliminary plans for hosting a follow-up visit to the school district. If the follow-up needs are handled through a phone call, documentation of that action is forwarded to the LEA designee. If a visit to the school district is required, an implementation plan and a confirmation form is forwarded. The implementation plan finalizes the arrangements of the visit in terms of location, site, date and time. The school principal and parents are required to sign the confirmation form and return it to CSEC to confirm the implementation plan as it serves as an acknowledgment that everyone who needs to attend is on notice and the equipment and supplies needed will be available. The cycle of evaluation and follow-up can be repeated as many times as necessary during the student's eligibility period.

STRENGTHS AND WEAKNESSES OF THE MODEL

The weaknesses in this model are few and are not insurmountable. Due to the fact that there is a 9- to 15-month waiting list from initial receipt of referral to completion of the preevaluation packet, the preplanning data are frequently dated. The temporary remedy to this has been a

written request for updated information; however, a more permanent solution will be the hiring of an additional full-time evaluation team. This change is proposed for the 1987-1988 school year, and will decrease the wait for an evaluation and essentially eliminate outdated data, because the potential exists to evaluate up to 90 students per year. That number is equal to the average number of evaluation referrals received per school year. Second, despite the efforts to select the most appropriate referrals through the screening information presented on the evaluation referral form, some students who are not ready for communication continue to filter through. To strengthen the ability to determine the most appropriate referral, an additional classification is being added to the options for processing an evaluation referral. Because it is next to impossible to control for how information is reported, when an unaccountable discrepancy exists in the referral information, the referral will be accepted pending collection of preevaluation data for further clarification.

The foundation of this service has been the staff. Selection of staff is very important. The preferred assets are as follows: a team player, clinical classroom experience with the population to be served with respect to age and diagnoses, confidence in professional abilities, oral and written communication skills, and willingness to perform beyond the call of duty.

The core of this model has been in place for almost seven years, with modification to professional evaluation procedures as the team members learned more through experience and professional development. The model has been expanded to include outreach services to remote areas of the state, where potential service users were not being served because of geographic distance. After a trial of three years, the current plan of providing outreach services is being changed. Instead of training evaluation teams to serve remote regions (inclusive of more than one school district), it is proposed that teams be trained at school sites. The results of this effort will continue to be training of local resources and speedy evaluation of students who are primarily candidates for manual communication systems. An additional benefit will be the provision of increased and improved services to students while they await an evaluation at CSEC. The strength of the design of this model comes from the excellent information, cooperation, and support gained from local university academe, national expert practitioners in augmentative communication, state and local school district administrators, and local service users. The forms and procedures used in the provision of this service are published in Volume III-M:Procedures for an Interdisciplinary Evaluation of Nonoral Students (1) for all to share. This of course is not the only model of service delivery, but it suits the needs and resources of the users. Other models, such as Project Teach (2) and the parallel profile approach (3), are similar in the attention given to the needs of augmentative communication users, but not in the resources used.

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CHAPTER 6

EVALUATING THE NEED FOR AUGMENTATIVE COMMUNICATION

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OVERVIEW OF ISSUES

Four major problems prevail in providing augmentative services for students. It takes personnel trained in the area of augmentative communication and related disabilities, materials and equipment, accessible space, and large blocks of time to evaluate and serve the augmentative communicator in any setting. There are relatively few trained professionals across the country. The materials and equipment can be quite expensive. Space is often at a premium in many schools. Money seems to be in short supply in the area of education. In spite of all these problems, schools are finding creative solutions for serving augmentative communicators.

Services are sometimes not developed because the need is not well defined. Augmentative communicators are often identified in the literature by a diagnosis such as autism or cerebral palsy which places them at risk for being a nonspeaker (Silverman, 1981). However, many individuals in these diagnostic categories are very functional speakers. Many other children in more vaguely defined groups have no functional means of communication. Care should therefore be taken when developing an evaluation and service delivery system to accurately identify the population of potential augmentative communication users. Many children at opposite ends of the scale are often overlooked. The unintelligible, speaking child may benefit from augmentative strategies until speech becomes more functional. At the other end of the scale the severely/profoundly multihandicapped child may be considered too low functioning for augmentative communication, but with systematic and small steps that child may progress to a formal communication system.

ISSUES

Evaluations can be conducted by an interdisciplinary team, by individuals from relevant disciplines with one individual coordinating the information, by a single individual, or augmentative communication can be introduced with no systematic effort to evaluate the child's skills and needs in relation to available systems. Various combinations of the above can also be tried. The evaluation can take place at a center, on site, or in consultation with on site personnel who carry out the evaluation under the direction of the consultant. Some evaluators do nothing but assess children, others assess and intervene with the same children, and still others supervise assessments only.

The best combination of team members for an evaluation will depend on the types of problems the child exhibits. The child with only the inability to speak and no associated problems needs a team of one. The child with complex problems need someone who can work with him/her and evaluate over a long period of time, developing solutions for problems where no good strategies

exist. Also, children with complex problems need individuals from many related disciplines to solve problems together in a compatible manner.

The focus of each evaluation should be on developing the most functional communication system possible, given the child's existing problems and skills. Unfortunately, all too often the expected outcome is the recommendation of a "best fit" device. We all communicate through multiple modes and have a complex communication system. Augmentative users need a system adaptable to many situations also.

OVERVIEW EVALUATION MODEL

The model is somewhat of a combination, based on the needs of the children being evaluated. All of the evaluators from each discipline also see children for intervention. The team regularly works together, however the elements of the team gathered for one child are based on the individual child's needs. Some of the children are seen in the school where they attend, others are seen for evaluation only to determine appropriateness for attending that school. Others are seen in order to assist another school in setting up a program for that child. A complete evaluation is important for setting up an appropriate augmentative program for each child. The diagnostic process is composed of four components for most school children:

1. The screening identifies the child as a potential augmentative communication user.
2. A diagnostic session or battery determines the origin of the inability to speak.
3. An evaluation using formal test instruments, administered in a standard manner, determines if the child qualifies under the law and rules and regulations of the school for a special program.
4. An assessment, using adapted formal tests and systematic observations, outlines the child's skills and deficits, which provides information for appropriate placement and programming.

1. Screening

A parent, care friend, physician, teacher or others may have identified the child as a potential augmentative communication user long before any formal action was taken. It is not unusual for a child not to be identified until after entering school. Parents and others are sometimes waiting for the unintelligible speaker to "grow out of it" for fear that augmentative strategies may prevent speech from progressing. At this stage there may need to be some education and reassurance that the augmentative intervention will be structured to promote speech before going on to the next step.

2. Diagnosis

The diagnosis of the source of the problem leading to the speechless state is frequently a medical issue and has often been determined before the child reaches school. In cases like these, taking a good history and requesting reports completes the school's responsibility at this level. There are exceptions. This author has experience evaluating a non-speaking child at the request of the teacher. The evaluator referred the child to a physician before completing the evaluation. The doctor diagnosed the suspected seizure disorder which the parents thought was clumsiness. Once regulated on medication the child began to speak.

3. Evaluation

Results on formal evaluations qualify a child for services. The evaluation, using formal test measures, should be administered without adaptations. The author once reported the adaptive testing results only and the school administrator reading the report rejected the child for services. The child had no speech and severe motor problems, but was a bright child with good language skills. The adapted testing results made the child look normal. The results of this testing should not be used to determine the content of a child's program. It serves only as a measure of the child's performance in comparison with normal peers.

Evaluations in the areas of cognitive, sensory, and motor skills should also be carried out. These and other related results will help to indicate other services needed for a well-rounded program.

4. Assessment

Adapted and informal testing to determine the child's skills is the most important part of the development of an individual child's program. The informal testing should be systematic. Testing can be based on normative information or on the skills known to be necessary for specific augmentative strategies. If a specific level of memory or motor skills are needed to activate a device that will meet the child's language needs, those skills should be tapped.

Related seating and positioning needs should be assessed with the child who has severe motor problems. Without appropriate positioning, the child will be unable to use even the best communication system. Since it is often costly and there are time delays in acquiring equipment, a flexible system should be available in the school. If that is not possible, a mock-up system should be set up on a temporary basis. Social, perceptual and other related skills need to be determined also.

Many augmentative communicators take a very long time to assess. If relevant skills are merely sampled, intervention can be started and the assessment can be completed during the therapy process. This is not ideal for setting up a theoretical program; however, if too much time is spent in assessment, many children lose interest in communicating a new way. This will only work if the individual conducting the intervention, whether a teacher, speech-pathologist, or other, is also a skilled evaluator or trained observer.

The skills for using a new device, symbol system or strategy can be assessed initially. If the child does not have the skills, but appears close, it can be introduced for practice in therapy and readiness reassessed after there is some familiarity.

The best designed and best fit system will go unused if the communication partners cannot figure it out. The people in the child's life will need training in the use of any new system. The attitude toward the system, the number of people who can use it easily, and the time listeners have to be available for communicating will all be factors in whether the child will succeed or fail with the augmentative communication system. Some systems are so sophisticated that they are adult dependent, leaving peers out of the interaction. Peer roles in communication need to be assessed also.

The environment in which the system is used needs to be evaluated. If the child has a wheelchair, walker, or other mobility device, the communication system needs to be used with each or at-

tached appropriately to it. Some of the child's equipment takes up a great deal of space that will be a consideration in small and crowded classrooms. If there are no reading series designed for augmentative communicators, the curriculum may be a deciding factor in some elements of a child's communicating system.

STRENGTHS AND WEAKNESSES

One of the strengths of on-site personnel for evaluation and intervention is the flexibility and responsivity to immediate communication needs. It is a time-consuming and labor-intensive system to set up. It does not work well when augmentative communicators are few and isolated.

IMPLICATIONS/SUGGESTIONS/RECOMMENDATIONS

With some creative planning, schools can set up an effective, efficient, and economic augmentative communication program for a single student or a group of students. Augmentative communicators are often some of the best students to integrate into normal classrooms or those intended for other types of special education needs. In order to set up a program, the school must first look at the type of augmentative communicators in the system, have each child evaluated and assessed, train or hire personnel, and then implement the program. The author has seen children well integrated into one-room school houses as well as larger systems.

In schools where only one or a few students are augmentative communicators, it may be more practical to contract with another school or agency for all or part of the program. This can range from having the child evaluated elsewhere to having the child attend another school on a full-time basis. Groups of schools have pooled resources to create programs for their children more economically. Development of an individual program seems more reasonable in big systems where there are larger numbers of children.

Although many new programs feel that money for equipment is the greatest problem, putting strategies to work is felt to be the greatest difficulty by more experienced projects. Money can be raised for a device if the child is a ready and capable user. Changing an individual's approach to use an augmentative system on a regular basis is more difficult.

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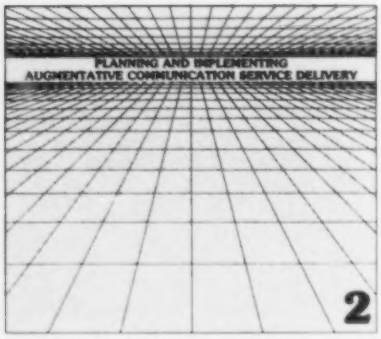

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